NetworkWorld
TECHNICAL SEMINARS

NEXT GENERATION MESSAGING

Capitalizing on Internet & Client/Server E-mail

DIRECTED AND PRESENTED BY DANIEL BLUM, RAPPORT COMMUNICATION

seminar overview

Enterprises across the world are eager to capitalize on Internet and client/server E-mail as a universal infrastructure utility for supporting vital groupware and electronic commerce applications. However, neither monolithic proprietary mail systems nor yesterday's shareware mail packages can successfully support high-volume, mission-critical applications on your Intranet, Extranets, or the Internet at large.

Internet and client/server messaging systems are based on proven yet dynamically evolving standards. Thanks to the wide acceptance of the standards, intense user demand, and strong vendor leadership programs, Internet and client/server mail products are becoming more robust and flexible. Through the smart deployment of messaging products that add value in the areas of standards, security, directory, management, and applications integration, enterprises can build sustained competitive advantage in a cost-effective manner.

Next Generation Messaging will help you decide what services you need from client/server Internet messaging, and what benefits your company can expect from upgrading to the latest standards and technologies. You will learn how, when, and why to deploy products supporting new standards like Multi-purpose Internet Mail Extensions (MIME), Internet Message Access Protocol 4 (IMAP4), Extended Simple Mail Transfer Protocol (ESMTP), and the Lightweight Directory Access Protocol (LDAP).

This seminar, taught by Daniel J. Blum of Rapport Communication, a leading expert in messaging, will also cover best practices for evaluating and selecting messaging products, lowering cost of ownership, migrating from legacy mainframe or LAN E-mail systems to client/server messaging systems, and sending information securely over the Internet. It covers tricky deployment issues, such as how to use mailing lists, message switching backbones, X.500, directory synchronization, and mail monitoring software.

Next Generation Messaging will provide you with the information and insight necessary to more efficiently and effectively implement and manage your messaging infrastructure.

16 KEY BENEFITS OF ATTENDING . . .

1. Anticipate and profit from key Internet/Intranet next generation messaging trends
2. Leverage open POP3/IMAP4 and LDAP access protocols
3. Configure a robust SMTP/MIME infrastructure
4. Understand major vendors' messaging product programs, and how to manage and maximize your investment in these offerings
5. Harness the messaging infrastructure for web-based mail and collaborative applications
6. Plan directory integration using LDAP, X.500, and meta-directories
7. Practice "safe messaging" using PGP or S/MIME
8. Assess "do's and don'ts" message-based electronic commerce
9. Analyze vendor product positioning
10. Evaluate Internet service provider (ISP) messaging connectivity or management support for small, mid-sized, and large enterprises
11. Understand and take advantage of different product/service pricing structures
12. Follow best practices for messaging administration, help desk, and management
13. Use proven methodologies for planning strategy, migration, procurement, and deployment
14. Define performance measures and service level expectations to maximize end user satisfaction
15. Master the intricacies of interconnecting standards-based and legacy messaging systems through gateways
16. Time-saving tips and pointers to valuable messaging information resources

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Your seminar outline

1. INTRODUCTION: E-MAIL EXPLODES

Along with the Web, E-mail is the "killer application" of the Internet. With over 125 million users worldwide and adoption spreading rapidly, E-mail is a mission-critical, competitive necessity for the modern enterprise. This section briefly reviews the three generations of messaging technology, discusses today's key trends, establishes basic Internet client/server messaging architecture definitions, and identifies the key requirements and considerations necessary for you to implement a messaging strategy. You will learn how to capitalize on converging messaging, collaboration, and commerce technology trends.

- Key messaging trends and background
- Business drivers for messaging
- Important user requirements
- Basic messaging architecture components
- Why Internet client/server messaging?
- Key tradeoffs
- Key strategic decisions

2. THE OPEN ARCHITECTURE

One of the reasons Internet client/server messaging is so successful is that there are a variety of standards for open protocols between the client, server, directory, and other components. Major messaging vendors are rapidly migrating their product lines to support these standards. This section will help you rapidly understand the basics of client/server messaging architecture. It will prepare you to evaluate or to "mix and match" different classes of products and services. It provides the basic information you need to improve the flexibility and functionality of your messaging environment as well as lower long-term costs.

- Open Clients
- POP3 mailbox access protocol
- IMAP4 mailbox access protocol
- LDAP directory access protocol
- ACAP configuration protocol
- Scalable message store servers
- SMTP and MIME message handling
- Domain Name System (DNS) routing
- Message Switch or MTA

CASE STUDY: Learn how to scale the architecture from the simple to complex environments, and from small installations to large installations. Learn best practices for Extranet and Internet messaging connectivity as well as for interconnecting message store servers, message switches, gateways, and directories within your Intranet.

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- **Comprehensive Seminar Workbook**
- **Exclusive Network World Electronic Messaging Resource CD-ROM**
- **Free 3-month trial subscription to *Rapport Messaging Review*, the premier industry newsletter covering the business and technology of electronic messaging**
- **Luncheon and break refreshments**
- **All of the above included in your $450 registration fee**

Note: If you can't attend, call us and order this informative and useful attendee materials kit for just $99!

3. HARNESS AND EXTEND MESSAGING'S POWER

A manageable open messaging infrastructure does not stand alone, but rests on the pillars of your enterprise directory, security, and management systems. This section will describe best practices for deploying these infrastructures, containing costs, and enabling a scalable, flexible, and highly responsive messaging system that integrates cleanly with groupware, electronic commerce, and Web applications on your Intranet or Extranets.

- Internet and Intranet directories
- Directory standards: LDAP, X.500, WHOIS, etc.
- Using directory synchronization
- Meta-directories
- Mailing lists
- Crypto concepts and the ASCII armor: S/MIME or PGP?
- Security Services: Signed, sealed, delivered
- Using management tools and techniques: SNMP, mail monitoring, message tracking, and more
- Gateways, backbones, E-mail integration services
- How to integrate messaging with
  - web-based groupware
  - electronic commerce
  - other Intranet applications and infrastructure

4. KEY VENDOR PRODUCT PROGRAMS

Established vendors of proprietary messaging systems have moved rapidly to deploy Internet client/server messaging technology. They have now been joined by a number of new players that began by adding features and functions on top of the standards. This section covers representative products and the current strategies of the major messaging vendors and Internet service providers (ISPs). It also discusses ways to manage and maximize your current investment.

- Messaging client vendors, market dynamics
- Messaging server vendors, market dynamics
- Related Intranet applications, market dynamics
- Messaging and directory integration, market dynamics
- Typical product pricing and packaging combinations

5. BUILDING A MESSAGING NETWORK

For the typical enterprise, messaging is the largest and most complex application ever to be deployed. It crosses all the organizational, geographical, and computing boundaries. This section concludes this seminar by discussing proven technical and business strategies for managing and deploying your messaging environment. It will discuss proven methodologies for obtaining organizational consensus/buy in to deploy high-function and cost-effective messaging systems.

- Overview of Rapport's Messaging Implementation Methodology
- Defining and prioritizing requirements
- Defining a messaging architecture
- Managing the procurement process
- Estimate and justify messaging costs
- Setting performance measures
- Maintaining service levels
- Best practices for cost-effective administration
- Migrating from proprietary to open messaging
- Wrap up

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☐	**JUNE 10**	**BOSTON, MA** - SHERATON NEEDHAM
☐	**JUNE 11**	**WASHINGTON, DC** - WASHINGTON MARRIOTT
☐	**JUNE 24**	**CHICAGO, IL** - HOLIDAY INN O'HARE
☐	**JUNE 25**	**ATLANTA, GA** - ATLANTA MARRIOTT NORTH CENTRAL
☐	**JULY 22**	**PHILADELPHIA, PA** - HOLIDAY INN/KING OF PRUSSIA
☐	**JULY 23**	**DALLAS, TX** - INFOMART

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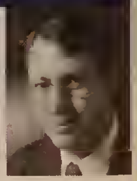
ABOUT THE SEMINAR PRESENTER: DAN BLUM



Daniel J. Blum is an internationally recognized expert consultant, writer, and instructor on electronic messaging, directory services, groupware, and electronic commerce. He has worked with key standards development committees, implemented messaging and directory systems, conducted extensive surveys of industry products, and advised industry and government users on the planning, architecture, procurement, and deployment of modern networks and value-added messaging services based on multiple technologies including Internet Mail, LAN E-mail, X.400 and other messaging backbones, meta-directories, LDAP, X.500, groupware, security, and EDI.

Blum has spoken at numerous trade conferences and his articles appear regularly in industry publications including *Network World*. He is the co-author of the book, *The E-Mail Frontier*, published by Addison-Wesley in July, 1994. Other publications include *Decision '96: A Critical Evaluation of the Hewlett-Packard, Lotus, Microsoft, and Novell client/server messaging/groupware product line*, and hundreds of white papers, articles, and columns.

Blum is a Principal at Rapport Communication. Rapport provides consulting, education, and publishing to users and suppliers in the fields of electronic messaging, directories, and information exchange.

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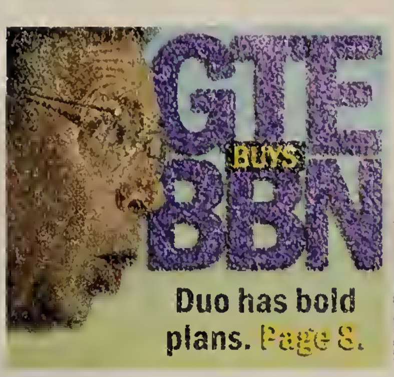
Network World

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



Duo has bold plans. Page 8.

A week in LAS VEGAS

By Todd Wallack

Las Vegas

It's that time of year again.

MCI 'Net guru Vint Cerf did the Macarena. Gaggles of vendors gabbed about Gigabit Ethernet. And the scent of DSL hung in the air.

About 55,000 attendees, 700 reporters and 650 vendors converged on the Las Vegas Convention Center last week for the latest edition of NetWorld+Interop, the king of network conferences. Many spent the week talking about upgrading their networks to finally meet end users' expectations and end the World-Wide Wait.

See Vegas, *page 14*

At Interop:

- Bay unleashes the network plan it hopes will take the company into the next millennium. Page 6.
- Cisco promises to unclog the Internet with new Gigabit Switch Routers. Page 6.
- Users react favorably to the multitude of Gigabit Ethernet announcements made at the show. Page 8.
- Nortel jumps into the IP Switching game. Page 10.

PHOTOS: JEFF SCHEID

FCC rules hinder telecom reform

By David Rohde

Washington, D.C.

Federal regulators last week issued the last of the major rules implementing telecommunications reform, but none of the big long-distance carriers seemed to find much in these rules to accelerate their entry into local markets. Nor did local carriers see these rules doing much to help them garner more of the long-distance markets.

In setting rules detailing how universal access would be paid for, the Federal Communications Commission somewhat reduced switched access charges — a key component of long-distance phone rates. But it also imposed increased phone line charges on business users.

AT&T's chief regulatory lobbyist, Gerry Salemme, said the overall impact of the FCC decision was a ''compromise'' that left in place a system in which local carriers charge far more for originating and terminating calls than it actually costs them.

Until those inflated access fees are wrung out of the system — and local carriers establish electronic ordering systems to accommodate the shift of large numbers of customers to alternate carriers — the pace of new telecom competition is likely to be slow, Salemme said.

''This was the last opportunity we had to alter the time schedule that was out there,'' said Brian Moir, an attorney here for several

See Universal, *page 16*

Get more info online:

- A copy of the FCC report
- Statements on the proposal from FCC commissioners
- An opposing view from a consortium of ISPs

FIND IT ON FUSION 1935

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Chaos reigns in domains

Government may step in to solve naming crisis.

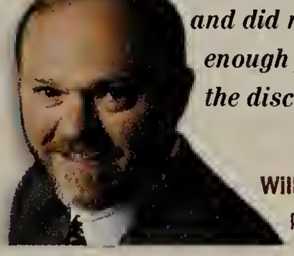
By Chris Nerney and Todd Wallack

As the Internet Society (ISOC) struggles to keep intact its fraying plan to revamp the Domain Naming System (DNS), some users fear the Internet is headed toward chaos or — worse yet — government intervention.

Internet professionals say that unless the global cyberspace community can achieve consensus regarding the much-criticized DNS, the Internet as we know it may cease to exist.

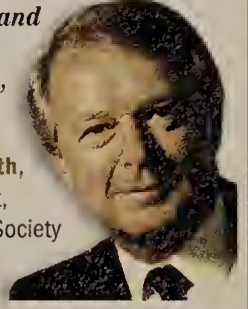
See PSINet, *page 57*

TWO VIEWS OF IAHC



"The work of the ad hoc committee was not complete and did not involve enough people in the discussions."

William Schrader, president and CEO, PSINet



"The IAHC proposal will ensure the stability and security of the Internet."

Don Heath, president, Internet Society

GroupWise tool fails to materialize

By Paul McNamara

Orem, Utah

As Novell, Inc. cranks up the volume on its ''Rock the Net'' marketing blitz, one of the company's most eagerly anticipated Web initiatives does not appear ready to keep the beat.

The Jefferson Project, designed to allow push-button publishing of GroupWise documents on the World-Wide Web, was originally scheduled for April beta and a summer release. Now the product will not even reach beta until June at the earliest, a company official said last week.

Jefferson is a potentially important weapon for Novell as the company struggles to regain momentum in a groupware market increasingly dominated by Lotus Development Corp. and Microsoft Corp. Industry experts said the product's slip can only hurt that effort.

''Every delay for Novell is going to be an issue,'' said Ian Campbell, an analyst with International Data Corp. in Framingham, Mass. ''Every delay for GroupWise is going to limit or have an impact on sales.''

See Jefferson, *page 57*

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Access Network World Fusion using the number in yellow. See page 5 for details.

Microsoft Exchange 5.0 is hard to find. Page 10.

Borland fights big brain suck

By Doug Barney

Fierce competitors Microsoft Corp. and Borland International, Inc. have moved their battle from the networked desktop to the courtroom.

Borland last week filed suit against Microsoft, alleging the Redmond, Wash., giant has been systematically recruiting Borland developers in an attempt to eliminate the company as a competitor. Microsoft and Borland are rivals in the budding Java and Internet tools markets.

See Borland, *page 57*

HERE'S THE AN
THE QU

Since the way you use your network has changed dramatically, now is an excellent time to question its conventional design. Put simply, your rigid system isn't equipped to handle the fluid movement of intranet traffic, Internet access, and new applications that take advantage of both. Enter Adaptive Networking.

Adaptive Networking

Q: ALL RIGHT, WHAT IS IT? Adaptive Networking is a set of products and cornerstone technologies that transition today's networks to the IP-optimized networks of tomorrow. The aim of Adaptive Networking is to build networks that are invisible to users, worry-free for network managers, and strategic for the business.

Q: WHAT DOES IT OFFER? Our philosophy is centered around more services with less complexity. How? Through transparent scalable technologies that ensure long-term, non-disruptive network evolution; drive operational productivity at every level of the organization; and adapt to changes in network usage and business requirements.

Q: WHAT ARE THOSE SCALABLE TECHNOLOGIES?

Bay Networks products are being developed around industry-leading cornerstone technologies: Access, Switching, IP Services, and Network Management.

Q: WHAT ABOUT RELIABILITY? When your network goes down, so does productivity. Not to worry. Adaptive networks are inherently more reliable and scalable thanks to symmetric multiprocessing and a distributed architecture. In other words, there's no single point of failure to bring down your network. Moreover, the system automatically reroutes traffic as needed to avoid bottlenecks. And you can easily add to, change, and modify your network without disrupting users. In fact, the network makes many adjustments all by itself.

Q: HOW CAN I REDUCE NETWORK OWNERSHIP COSTS?

A good question, considering that administering and managing your network likely consumes the bulk of your IT budget. Adaptive networks automatically find and configure

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SWER. WHAT'S ESTION?

new devices. Which, coincidentally, saves your IT staff considerable time. And thanks to our Autosensing Technology, the system determines which users have 10Mbps or 100Mbps capabilities, for example, and matches them with the bandwidth they need.

Q: HOW CAN WE AVOID SURPRISES?

With Optivity®, your IT staff can proactively manage all the devices in your network as one cohesive system—even if it extends across the Internet. Optivity also provides the powerful ability to visualize and analyze real-time traffic flow across your entire network. Intelligent agents monitor your network infrastructure, keeping your IT staff informed of changing conditions and often making adjustments as needed to ensure the overall health of your network. What's more, Optivity includes analytical tools for capacity planning to help reduce budget surprises.

Q: WILL IT WORK WITH WHAT I'VE ALREADY GOT?

Of course. It wouldn't be truly adaptive if it didn't. You can adopt this technology at your own pace in cost-justifiable increments. Adaptive Networking even makes our competitors' products smarter and faster. Good news, since you probably already own some.

Q: CAN IT GIVE MY BUSINESS A COMPETITIVE EDGE?

Definitely. You can offer hot, new services and build closer links with customers and business partners. Should they need access to your corporate network from the Internet, you can offer secure, virtual private network connections. Want to add voice-over-IP capabilities to link customers and service representatives from your Web site and reduce long-distance phone costs? Adaptive Networking can do this and much more.

Q: WILL IT WORK WITH THE LATEST APPLICATIONS?

Applications drive your network needs. That's why adaptive networks shift on the fly to match routing priorities to your applications. For example, financial transactions and video conferencing can take routing priority over e-mail packets and Web browsing.

Q: WHAT ABOUT ADDING NEW CAPABILITIES?

With exciting, new advancements occurring daily, you'll want to add the latest capabilities as they arrive. Equally important, you'll need to adopt them without ripping and replacing hardware. With Adaptive Networking, making these changes is a simple software upgrade.

ANY QUESTIONS?

If your network can't do all of this, maybe it's time to start asking a few questions of your own. Like "How soon can I put Adaptive Networking to work for my business?" For a free strategy paper, visit www.baynetworks.com/adapt/a6 or call 1-800-8-BAYNET ext. 297. Adaptive Networking is exactly what your business needs. Without question.

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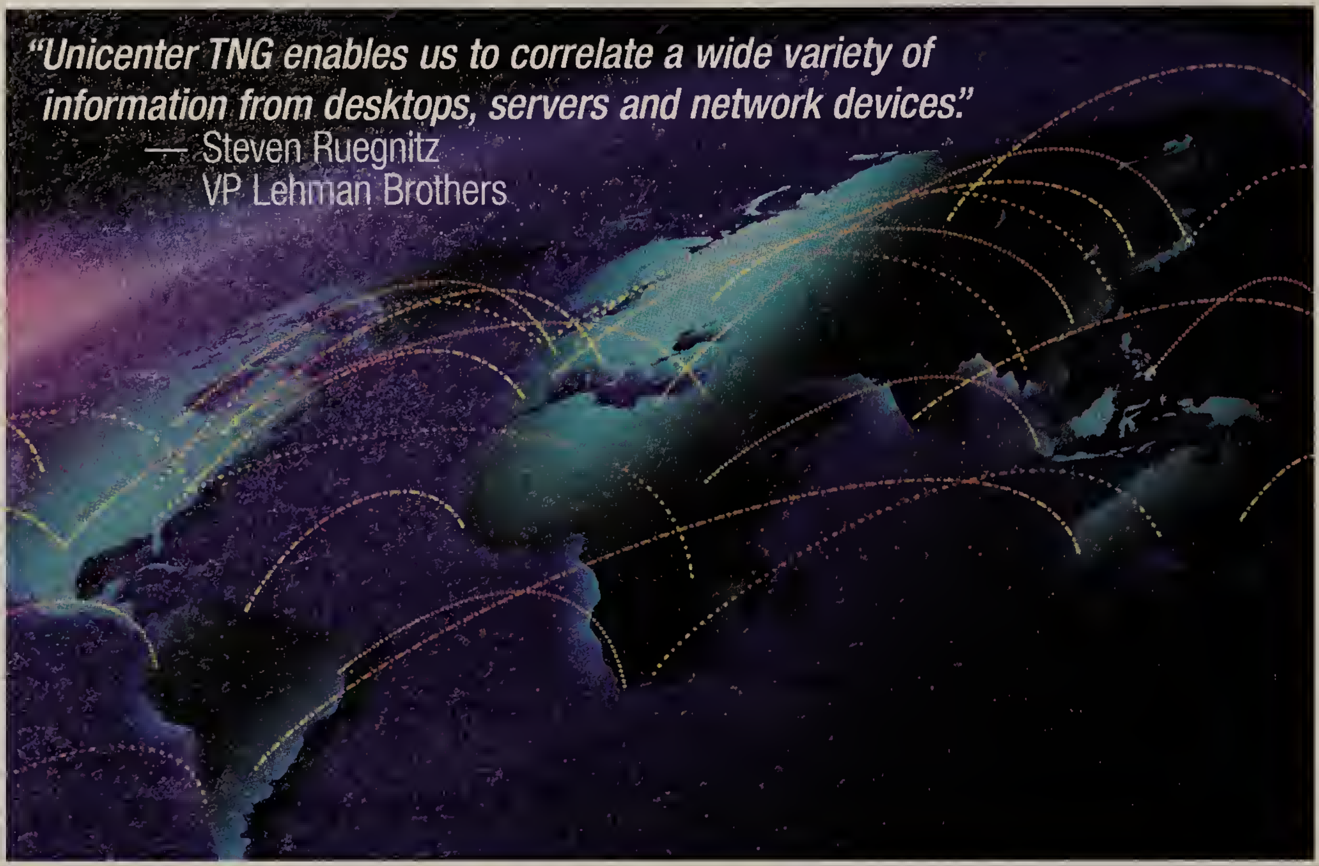

"Unicenter TNG enables us to correlate a wide variety of information from desktops, servers and network devices."
— Steven Ruegnitz
VP Lehman Brothers

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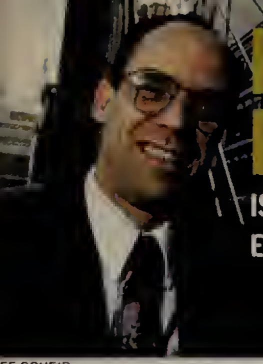


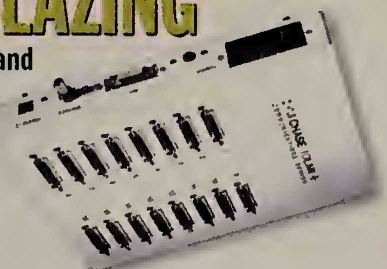
FF SCHEID

HOLD THE GIGABIT PHONE

IS Director Steve Vollmer doesn't see Gigabit Ethernet need for five years. Page 8.

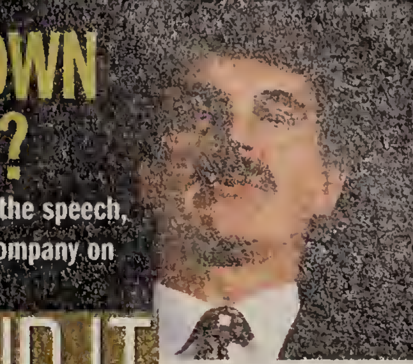
TRAILBLAZING

Chase Research and Lantronix cut a path to high-speed dial-up access. Page 19.



BURNIN' DOWN THE HOUSE?

Bay's David House botched the speech, but will his vision get the company on track? Page 6.



JEFF SC

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8 **GTE makes bid to become** a full-service carrier with plan to buy BBN and a large fiber-optic network from Qwest.

10 **Nortel is shipping** its own version of switched routing.

10 **MCI promotes** incremental ATM.

10 **Microsoft's Exchange Server 5.0** is temporarily out of stock.

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ISOC says it is surprised and frustrated by the 'Net communities' reluctance to back its efforts to expand the number of top-level domains and registries. Page 58.

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58 **'Net Buzz:** Internet Society struggles to look like a leader; Spam King reports hack attack; Iowa-based company buys online investment site; USWeb unveils new program.

Network Help Desk. *Page 39.*

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Editorial and advertiser indexes. *Page 56.*

FEATURES

TICK, TICK, TICK . . .

Our quarterly Broadband Ticker brings you the latest developments on frame relay and ATM products and services. Page 43.

LAB NOTES: WEB SITE WONDER

Lab Notes

NetObjects' Fusion will win a warm welcome from weary Webmasters. Page 45.

FIND IT ON FUSION

To quickly get to any online info referenced in *Network World,* enter its DocFinder number in the input box on the home page.

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This Week

Only on Fusion

- **Interop.** Vint Cerf dancing the Macarena? Yep, and we've got the proof, along with a complete roundup of NetWorld+Interop 97 keynotes and other news. **DocFinder: 1938**
- **Internet.** One man's smut is another man's literary discussion. The American Civil Liberties Union last week filed suit against a new Virginia law that outlaws the use of state computers to distribute "sexually explicit" material. Read the ACLU complaint and relevant sections of the law. **DocFinder: 1939**
- **Security.** IBM last week showed off single sign-on software for network applications and services. **DocFinder: 1940**
- **WAN services.** IBM will buy out Sears' stake in Advantis, the value-added network the two formed in 1992. **DocFinder: 1941**

This week

- **IP Multicasting.** Several vendors announced IP Multicasting offerings at Interop last week (page 35). Get details along with overviews of the technology, a multicasting glossary, and a case study of a financial firm that is using IP Multicast. **DocFinder: 1926**
- **Internet.** Read up on Novell's enhancements to its virtual private networking software (page 27) and grab a primer on how to set up your own VPN. **DocFinder: 1924**
- **Letters.** Readers sound off about Bill Gates, political correctness and secure transactions on the Internet. **DocFinder: 1925**

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News briefs, May 12, 1997

Cutting encryption a break

The U.S. government has softened its hard-line restrictions on the export of data encryption technology and will now allow the export of the strongest available encryption, but only for financial and electronic commerce applications, the Department of Commerce announced last week.

New regulations will be published that allow the export of encryption products that support such financial transactions as direct home banking, without key escrow.

However, the Clinton administration said it remains committed to public-key recovery for all encryption software not used for electronic commerce or banking applications.

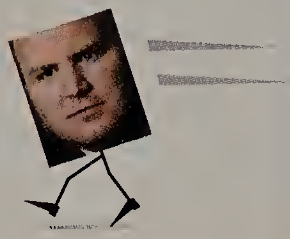
New gigabit switch on DEC

At NetWorld+Interop 97 last week, Digital Equipment Corp. demonstrated Gigabit Ethernet extensions to its GIGAswitch and MultiSwitch 900 platforms. For the network edge, Digital demonstrated a Gigabit Ethernet uplink module, called VNswitch 900GV, for its MultiSwitch 900.

At the network core, Digital displayed GIGAswitch/Ethernet, a modular Gigabit Ethernet and Fast Ethernet backbone switch offering throughput in excess of 20G bit/sec. For servers, Digital is developing the EtherWORKS/1000 line of Gigabit Ethernet adapters. Pricing and availability were not disclosed.

Follow the bouncing executive

After his high-profile defection from Cisco Systems, Inc., and only three weeks on the job at Big Blue, Nick Francis resigned as vice president of marketing for IBM's Networking Hardware Division (*NW,* April 14, page 17). Francis told a Raleigh, N.C., newspaper he doubted IBM's bureaucracy would let him achieve change at the rate he wanted. IBM declined to discuss "personnel move decisions."



Stop the E-mail insanity

The Coalition Against Unsolicited Commercial E-mail (CAUCE) on Friday announced a campaign to extend junk fax laws to cover E-mail. CAUCE is proposing an amendment to a federal law restricting the use of telephone equipment. The amendment would add computer equipment and computer networks to the law, which currently carries a $500 fine.

Netscape 'pushes' out beta

Netscape Communications Corp. this week is scheduled to make available for download a beta version of its new Netcaster push client component. Just last week, Netscape released early bits for Preview Release 4 (PR4) of its new Communicator browser/groupware client. Features include: corporate address books; "smart update," which gives users the ability to get automatic updates of software components; "smart resume," which allows users to download software or files where they left off in the event of a net shutdown; and "auto complete," which completes a URL after a user types in a few letters. PR4 is available on Windows 95, NT and 3.1, according to a Netscape spokeswoman.

Going Postal on EC

Realizing that its traditional mail delivery service will not provide significant growth in the long term, the U.S. Postal Service is developing an ambitious electronic commerce business.

Next month, the Postal Service will begin testing an electronic commerce scheme, through which it will offer U.S. corporations the ability to sell goods and services in the global market over the Internet, according to officials at Digital Equipment Corp., the scheme's systems integrator.

Bay bets on Adaptive Networking

New strategy, product plan focuses on switching, access, IP services, net management.

By Jodi Cohen
Las Vegas

Adaptive Networking may be Bay Networks, Inc.'s new strategy, but it is based on very few new ideas, industry observers said.

David House, chairman, president and CEO of the struggling internetwork player, last week revealed his plan to get Bay back on track. Under Adaptive Networking, the new Bay will be focused on four key technology areas: switching, access, IP services and network management.

But Adaptive Networking did less to differentiate Bay from competitors 3Com Corp., Cabletron Systems, Inc. and Cisco Systems, Inc. — which are targeting those same areas of focus — and more to simply show the industry that the company is back onboard, analysts said.

"At least [Bay] is in the hunt now," said Don Miller, chief analyst of networking services at Dataquest, Inc., a market research firm based in San Jose, Calif. "But I didn't hear anything new or any big surprises from House."

One competitor blasted the Bay strategy.

"Adaptive Networking may be new to David House, but it is not new to the industry. All of this is rehashed content," said 3Com CEO Eric Benhamou.

But what House did provide, along with a detailed product road map, was a new sense of energy and excitement that has been missing at Bay since the SynOptics Communications Corp./Wellfleet Communications, Inc. merger a few years ago. "The troops are really fired up, and they have real leadership now," Miller said. "The key for Bay now is execution."

House *adapts to new networking role.*

JEFF SCHEID

One analyst, who pointed out Bay has been known to miss ship dates, agreed. "Bay absolutely must ship on time," said Skip MacAskill, senior analyst at Gartner Group, Inc., a consultancy based in Stamford, Conn. "It's either deliver or die."

Shipping product on time is one thing, but having the vision to carry a networking company into the next millenium is another. Analysts still question whether House, a 22-year veteran of Intel Corp., is the right man for the job after witnessing his keynote address at NetWorld+Interop 97 last Monday.

"He missed a large opportunity to influence the crowd about what's going on in the ISP space, one of Bay's key focal areas," said Craig Johnson, director and principal analyst at Current Analysis in Herndon, Va. "He started off by saying, 'What's a PC guy [doing] talking to you about networks?' and he never closed the loop. That's not the image you want to portray here."

Product specifics

Despite the image problem, Bay seems intent on delivering Adaptive Networking. The first area of attack is Layer 3 switching.

The company unveiled its Route Switch Processor (RSP) IP Switching chip, which will become the foundation of Bay's new products. In fact, Bay claimed the Application Specific Integrated Circuit will enable the company to reduce the $5,000 per-port price for multiprotocol routing to $500 per port for an IP routing switch.

Bay's frame-based backbone switch strategy includes:

- Lower pricing for 10M bit/sec switches with 100M bit/sec uplinks that will ship in the third quarter. Bay currently offers a 10/100 switch for $250 per port.
- High-performance Layer 3 routing switches, based on the RSP, with 100M bit/sec and 1G bit/sec Ethernet links, which will ship in the first half of 1998.

On the ATM switch side of the house, Bay will offer:

- Ethernet and token-ring workgroup switches with ATM uplinks, based on the Multi-LAN Centillion box, that will ship early in the third quarter.
- Enhancements to the Multi-LAN Centillion platforms, including higher density Ethernet, Fast Ethernet, token-ring and ATM interfaces, which will ship this year.
- Software upgrades that support Private Network-to-Network Interface, Internet Group Management Protocol for IP Multicast and Multiprotocol over ATM for Layer 3 switching over ATM, to ship in the first half of 1998.

In addition to switching, the company will roll out product specifics and delivery dates in the access, IP services and net management areas, House said.

Senior Editor Jim Duffy contributed to this story.

Cisco moves past 7500 router line

By Bob Brown and Jim Duffy
Las Vegas

Cisco Systems, Inc. last week previewed the Heimlich maneuver that could revive the Internet and intranets choking under the limited performance of Cisco's current routers.

Cisco unveiled its next-generation 12000 Gigabit Switch Router (GSR) line, a pair of switch-based routers targeted at Internet service providers looking to unclog congested links (*NW,* March 31, page 1). Although initially aimed at ISPs, end users will benefit from several technologies that will be available for the 12000 and the flagship 7500 router line.

"I'm kind of excited about them, but not so much for implementation in our network," said

See **Cisco,** *page 8*

Next-generation routers

Product	Gigabit Switch Router 12004	Gigabit Switch Router 12012
Chassis slots	4	12
Gigabit Ethernet or OC-12 (622M bit/sec) ports	3	11
OC-3 (155M bit/sec) ports	12	44
Switching fabric capacity	5G bit/sec	15G to 60G bit/sec
Price	Starts at $20,000	Starts at $30,000

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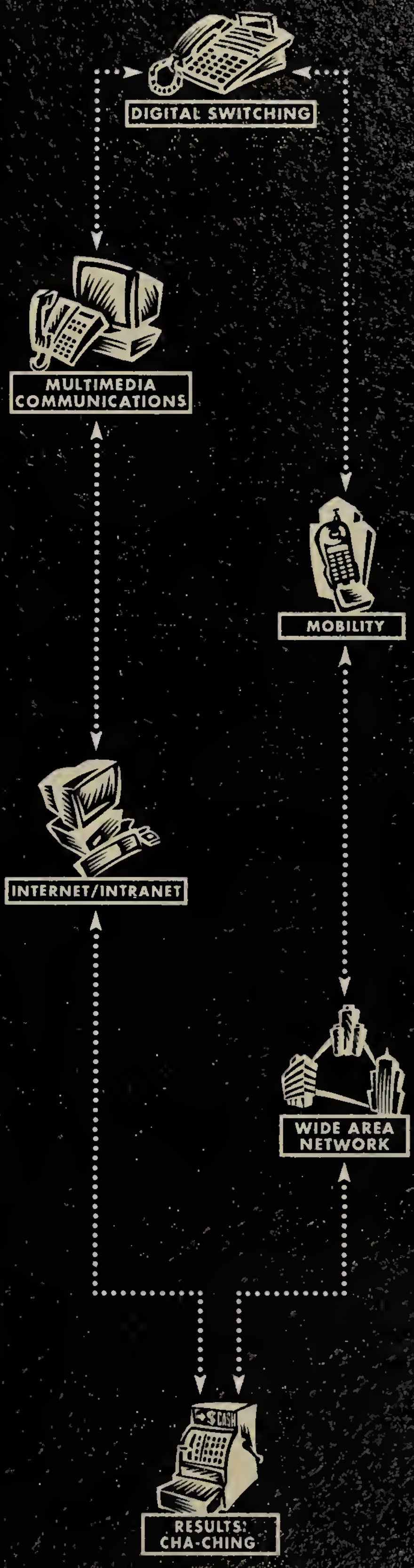

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Users gab about the Gigabit Ethernet gamble

By Jodi Cohen

Las Vegas

Gigabit Ethernet: It's here, it's hot and it was the heart of the NetWorld+Interop 97 show.

Whether it was the jam-packed booths of start-ups such as Prominet Corp. and Rapid City Communications or the standing-room-only sessions about Ethernet in overdrive, Gigabit Ethernet stole the spotlight here last week.

TWO USER VIEWS OF GIGABIT

"We originally thought we'd go with ATM, but . . . Gigabit Ethernet could be a better choice."

Chuck Benton, special projects team leader, Nevada Power Co.

"I don't think the need for gigabit will be here for about five years."

Steve Vollmer, director of information systems,.New York, New York Hotel and Casino

JEFF SCHED

And there was no shortage of products on display: A whopping 27 vendors showed off hub, switch and network interface cards in the Gigabit Ethernet Alliance booth, providing attendees with the industry's first look at Gigabit Ethernet gear.

Many users found themselves wondering when — not if — Gigabit Ethernet would find its way into their networks.

"Every vendor here seems to have Gigabit Ethernet, so that makes me feel pretty secure about moving in that direction," said Mike Lutz, a senior system and network administrator at Norand Corp., a Cedar Rapids, Iowa-based maker of handheld PCs. "Gigabit Ethernet is simpler than ATM and probably will cost less."

Lutz and other customers evaluating Gigabit Ethernet had a lot of questions. One of the most burning ones was how the speedy frame-based technology stacks up against ATM cell switching.

"Are there any significant benefits for LAN/WAN integration, and how will the pricing compare?" Lutz asked. Others wondered if Ethernet could support ATM's quality-of-service capabilities, which will be needed for integrating voice, video and data.

ATM user Steve Stern, chief information officer at the Las Vegas Veterans Hospital, is not ruling out Gigabit Ethernet for multimedia. "We are doing videoconferencing, telemedicine and digital radiology, which right now requires ATM," he said. "But if you throw enough bandwidth at it, I think Gigabit Ethernet would also be able to handle multimedia applications."

One Cabletron Systems, Inc. customer who used to favor ATM is now entertaining the idea of Gigabit Ethernet.

"We originally thought we'd go with ATM, but the standards weren't there yet so we had to hold off," said Chuck Benton, special projects team leader at Nevada Power Co. in Las Vegas. "Now Fast Ethernet and Gigabit Ethernet could be a better choice."

Still, Gigabit Ethernet may not happen for a while.

"I don't think the need for Gigabit [Ethernet] will be here for about five years," said Steve Vollmer, director of information systems at the New York, New York Hotel and Casino here. "But I'm glad to see so many vendors working on it now."

Norand's Lutz plans to use Gigabit Ethernet for interswitch links and has a more immediate need for speed. "I'm thinking we'll want to install a Gigabit Ethernet backbone switch in the next year or two," he said.

When it comes to purchasing gear, customers were split on whether to go to large vendors such as 3Com Corp., Cabletron or Cisco Systems, Inc. or to go with a hot little start-up such as Foundry Networks, Inc. or Extreme Networks, Inc.

"I'd like to buy from a vendor that offers both Gigabit Ethernet and ATM gear to avoid getting locked into one technology, so I'll probably lean toward the big guys," Lutz said.

But Nevada Power's Benton said he likes the little players. "Start-ups have the ability to be very aggressive, so I tend to look more at the features of the product rather than just the size of the company," he said.

No matter which size vendor you prefer, it seems most internetwork players will have Gigabit Ethernet offerings out by the time the IEEE 802.3z standard is set, which is expected during the first quarter of 1998. ■

Cisco

Continued from page 6

Roy Hegge, senior network engineer at ADC Telecommunications, Inc. in Minneapolis. "The Internet service providers need that kind of bandwidth, which is going to help us because we're becoming very dependent on the Internet."

The key differentiator between the GSR and the 7500s is that the GSR is based on a multigigabit crossbar switching fabric that improves router performance by speeding the flow of data from line card to line card within the router. The 7500 routers are built on a less scalable, shared bus architecture.

The first two GSR models, the four-slot 12004 and the 12-slot 12012, will boast switching capacities of up to 5G bit/sec and 60G bit/sec, respectively. However, the GSR architecture design is such that Cisco could roll out a 16-slot model with 80G bit/sec of switching capacity later, said Richard Palmer, director of marketing for Cisco's Core Products Business Unit (*NW*, March 31, page 1).

Initially, the GSRs will include OC-3 (155M bit/sec), OC-12 (622M bit/sec) and Gigabit Ethernet interfaces. Eventually, the 12012 will be outfitted with up to 11 OC-48 (2.4G bit/sec) interfaces. The current 7500 line's interface speeds top out at OC-3.

The GSR can be configured for full redundancy of interface cards, processors and more.

Cisco will begin shipping the GSR this fall, with OC-48 support available next year.

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GTE gobbles up BBN

By Denise Pappalardo

Local exchange giant GTE Corp. last week made a bold move to become a national soup-to-nuts service provider by shelling out $616 million to buy BBN Corp. and another $485 million to acquire a 13,000-mile fiber-optic network from Qwest Communications Corp.

The BBN purchase, if approved by shareholders and the government, would bring under the GTE umbrella BBN Planet, a national Internet service provider, as well as BBN's technology research and development group. BBN Planet offers managed 'Net, firewall and Web hosting services.

BBN customers were generally optimistic about the planned acquisition, but some were hesitant. "One of our key interests is that our ISP keeps up with our growth," said David Bohnett, chairman and CEO at GeoCities, a Santa Monica, Calif.-based company that creates communities of interest on the Web. "We are enthusiastic about this partnership because it gives BBN access to capital to build out its network and meet our growth projections."

GeoCities is also a GTE local telephone customer, so integrated billing for local and Internet services would ease administration, he said. But Bohnett is concerned that his business will not have the same visibility with the management of the merged companies.

GeoCities is not alone. Other customers wonder if the corporate culture at GTE will affect BBN's business practices.

"We're used to BBN's small-shop mentality," said Charlie Hart, vice president of technical services and solutions at Massachusetts Financial Services Co., a Boston-based mutual funds management company. "We don't want the personal attention we get from BBN to be diluted by GTE," he said.

While cultural changes are almost always part of a merger of this size, GTE is hopeful customers will see and feel the benefits of its new deals, especially its fiber network build-out. GTE's investment in Qwest's fiber network will let GTE extend its net to 92 metropolitan areas when it is completed in late 1998.

GTE also signed an agreement with Cisco Systems, Inc. to beef up the overall GTE network. And GTE agreed to partner with Cisco on bundled hardware and network services.

In order to support its new national service offerings, GTE said it has created a sales force whose mission is to market packages of local, long-distance, Internet and wireless services coast to coast.

"Our intention is to establish GTE as a national full-service provider," said Charles Lee, GTE's chairman and CEO.

"[GTE] has seen phenomenal growth this past year moving into new markets," said Eric Paulak, senior analyst at Gartner Group, Inc., a Stamford, Conn.-based consulting firm. "It's added 1 million new residential customers and 100,000 Internet customers. Now it's time for them to move into the business market where there are better profits to be made."

AP PHOTO

GTE Chairman and CEO Charles Lee *(far left) makes his point with purchase of BBN.*

GTE is working out details on how it will integrate the BBN, Qwest and current GTE networks. But GTE said it will continue to use UUNET Technologies, a BBN rival, to serve residential customers, said Terri Compton, GTE's vice president of new business development. The BBN services will be more focused on business customers.

One other agreement that bears watching is one between AT&T and BBN Planet. BBN Planet, which many observers thought AT&T would buy, currently carries AT&T's WorldNet Internet traffic. But a clause in the AT&T-BBN Planet agreement allows AT&T an out in the event of a change in management focus at BBN Planet.

"We can't yet address how the acquisition will affect the duration of the contract," an AT&T spokesperson said.

Senior Writer Tim Greene contributed to this story.

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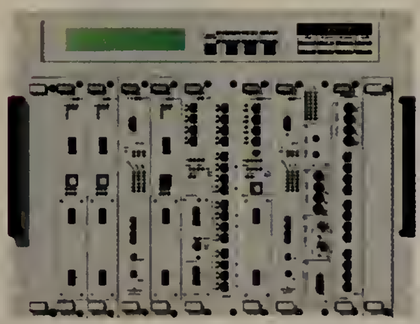

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Nortel gets hip to IP switching

Virtual Network Switching will cause users to migrate to ATM.

By Tim Greene
Las Vegas

Northern Telecom, Inc. last week announced its effort to speed routed networks by letting switches do more of the work.

Virtual Network Switching (VNS), available on Nortel Passport ATM switches, has some pretty impressive company. IP switching is already heavily promoted by Ipsilon Networks, Inc., and rival Cisco Systems, Inc. is pushing Tag Switching technology. All promise to ease congestion in routed networks. In fact, the underlying principle of all three is the same: Avoid direct router-to-router hops that re-quire time-consuming route table lookups.

VNS capabilities alone are not enough to warrant investment in the switches. However, the capability would open a range of possibilities for users that have already decided it makes sense to have ATM in their WAN, according to Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J.

For example, VNS, which dynamically establishes switched paths, could support sites that do not warrant static permanent virtual circuits.

On the fly

Also, VNS could guarantee quality of service on the fly for applications that require low delay, such as collaborative videoconferencing, Nolle said.

A VNS WAN would be compatible with a LAN using IP Switching, said Tony Rybczynnski, director of strategic technologies and marketing for Nortel. A VNS-enabled switch could interface with LAN gear through Routing Information Protocol, Open Shortest Path First or PPP, Rybczynnski said.

Currently, VNS supports switching over Nortel's hybrid frame/cell infrastructure. Next year, Nortel plans to introduce standards-based Multi-Protocol over ATM, which would ride across a pure ATM-standard backbone.

The switches support physical interfaces for Ethernet, token ring, FDDI and ATM, he said.

Next year, Nortel plans to introduce standards-based Multi-Protocol over ATM, which would ride across a pure ATM-standard backbone.

Cabletron signs on

The Nortel effort last week was supported at NetWorld+Interop 97 by Cabletron Systems, Inc., even though the two companies' technologies are not interdependent.

Cabletron supports its own version of Layer 3 switching, which Nortel does not support. If a network contained both technologies, switched paths would have to be established separately through the parts each company's gear controlled.

Packets entering a Nortel switch are given a label. Then, using switched virtual circuit signaling, they are switched through the ATM backbone to the switch nearest the destination address. That architecture is similar to Cisco's Tag Switching. ■

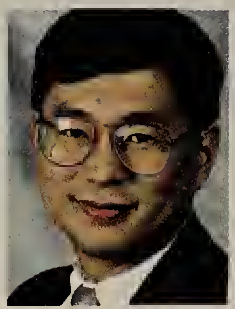
ATM

MCI ATM service hovers between T-1 and T-3

By Denise Pappalardo
Las Vegas

MCI Communications Corp. last week announced an enhancement to its HyperStream ATM service that will let users incrementally add T-1 chunks of bandwidth to their WAN. The enhancement is based on the ATM Forum's pending Inverse Multiplexing over ATM (IMA) specification.

MCI's HyperStream ATM inverse multiplexing service offers users a virtual single ATM connection. That connection is actually multiple T-1 (1.544M bit/sec) connections.



MCI's Kang *says specification is due any day.*

The service offers an alternative to jumping right into a T-3 (45M bit/sec) ATM service. Instead, through IMA, network managers can bundle two, four, six or eight T-1 ATM lines.

The enhanced service offers users the flexibility of deploying any router or switch as long as it supports the ATM Forum's IMA specification.

While the spec is not final, it has been through several voting processes within the forum, said Ray Kang, director of broadband services at MCI.

"The final spec is due any day," he said.

While other service providers such as Sprint Corp. already offer ATM inverse multiplexing services, these services are based on proprietary implementations, said Jay Pultz, research director at Gartner Group, Inc., a Stamford, Conn.-based consulting firm.

Proprietary versions of ATM inverse multiplexing limit network managers to using a single vendor's device at their site, Pultz said.

Sprint plans on upgrading its IMA support to the ATM Forum standard in the near future, according to a Sprint spokesperson.

IMA uses the forum's constant bit rate (CBR) specification, which lets switches and routers transmit ATM cells over multiple connections in a timed sequence.

The timed sequence makes it easier to reassemble the cells at the customer end with minimum cell loss, Kang said.

Without CBR, there are delay issues that interfere with the quality of IMA transmissions, he said.

The MCI service is slated for availability in July.

Although MCI would not reveal costs for its new ATM service, Kang said the pricing will be comparable to its NxT-I frame service, which it announced earlier this year.

That service's monthly rates range from $2,449 to $5,689 for two T-1s and as many as eight T-1s respectively.

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Exchange 5.0 sellout slowing rollouts

Microsoft officials say inconvenience will last only a few weeks.

By Paul McNamara
Redmond, Wash.

Only weeks after hitting the open market, Exchange Server 5.0 is out of stock. The sales surge has Microsoft Corp. executives beating their chests and some frustrated customers tearing their hair out.

"We were supposed to go to production with [Exchange] 5.0 at our plants already," said an IT manager at one major corporation with two dozen sites, 4,000 Exchange users and zero gold copies of Exchange 5.0, Microsoft's latest messaging/groupware package. "We've been holding up waiting for the CDs, the distribution disk, and we were told yesterday that the problem is in Microsoft's court."

True enough, Microsoft confirmed, although here the situation is seen as more of a mixed blessing than a headache.

"We always expect a pretty good [sales] bump when we release a new version," said Rob Shurtleff, lead product manager for Exchange.

"And I heard that things were going very, very well. But I did not realize they were going this well," he said.

Exactly how well? Shurtleff would not specify, but at least three of the most popular Exchange models — 10-user, 25-user and upgrade packages — are currently unavailable, at least from Microsoft.

Production of some packages should resume this week, Shurtleff added. "Certainly, by about the third week of the month things ought to be back to normal," he said.

Shurtleff suggested that customers unable to wait can download a promotional version of the software from Microsoft's Web site. "With the exception of the fact that it has a [30-day] time bomb in it, it is the same bits," he said.

That has unsatisfied corporate customers wondering whether a pecking order of sorts is at work here.

"Some of the larger companies that are rolling out 40,000 or 50,000 clients get more attention than people who are dealing with 4,000 clients," the IT manager complained.

While Microsoft wrestles with its manufacturing challenges, the company last week also confirmed some details of what users can expect in the next version of Exchange, code-named Osmium.

The upgrade will include a major increase in Exchange's current 16G-byte message store, as well as support for Internet Message Access Protocol 4 and Lightweight Directory Access Protocol. A workflow element will also be added, although Shurtleff declined to discuss its specifics.

A summer beta is planned, he said, with release "before the end of the year."

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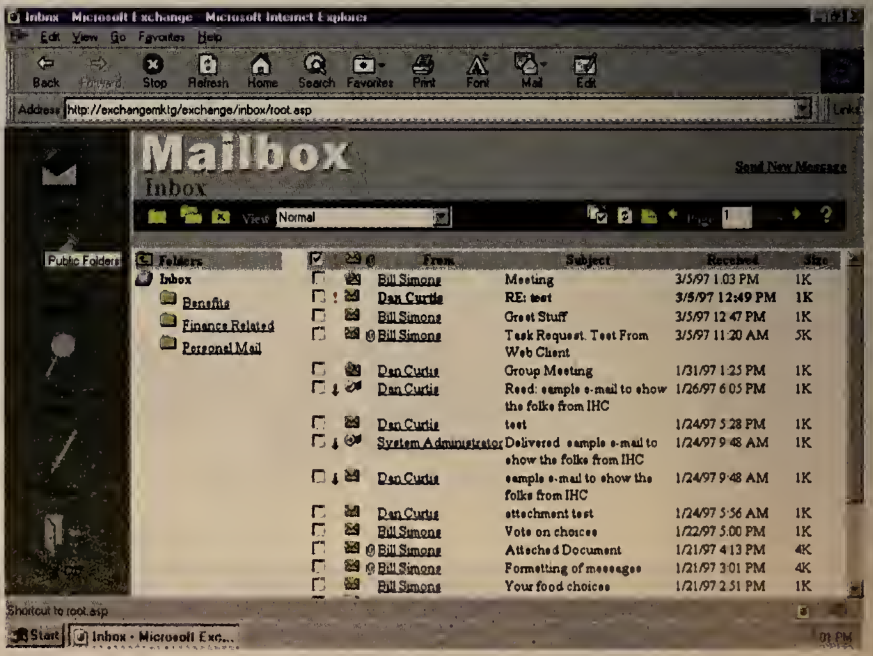

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Bill Simons	Great Stuff	3/5/97 12:47 PM	1K
Bill Simons	Task Request. Test From Web Client	3/5/97 11:20 AM	5K
Dan Curtis	Group Meeting	1/31/97 1:25 PM	1K
Dan Curtis	Read: sample e-mail to show the folks from IHC	1/26/97 6:05 PM	1K
Dan Curtis	test	1/24/97 5:28 PM	1K
System Administrator	Delivered sample e-mail to show the folks from IHC	1/24/97 9:48 AM	1K
Dan Curtis	sample e-mail to show the folks from IHC	1/24/97 9:48 AM	1K
Dan Curtis	attachment test	1/24/97 5:56 AM	1K
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Bill Simons	Attached Document	1/21/97 4:13 PM	4K
Bill Simons	Formatting of messages	1/21/97 3:01 PM	4K
Bill Simons	Your food choices	1/21/97 2:51 PM	1K

Two months after its release, *Microsoft's Exchange Server 5.0 is out of stock. This development has some customers displeased, although company officials insist the shortage will only last a few weeks.*

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Windows NT 5.0 gets grip on distributed apps

By Christine Burns
Orlando, Fla.

Microsoft Corp. is prepping its upcoming NT 5.0 Active Directory Service for a leading role in the company's crusade to make Windows a linchpin for distributed computing across enterprise networks.

In his keynote address to more than 15,000 users and developers at the annual TechEd conference here last week, Microsoft Chairman and CEO Bill Gates said his company is adding technology to Windows to make it a better platform for running distributed object-based applications.

For starters, Microsoft is expanding its existing Windows-based Common Object Model (COM) architecture for building and deploying application components to address scalability and manageability issues.

"We're taking leadership in distributed computing," Gates said. "By taking COM to a whole new level, we let you leverage the infrastructure like never before."

Enter Active Directory.

Microsoft will provide an Active Directory container, called a class store, that will serve as a central registry for all information relating to COM objects. This container will accommodate all existing and future COM objects, regardless of the language used to build them.

This centralized repository will provide something sorely lacking in component-based applications — a standard way for objects to consistently locate each other on distributed networks.

For administrators who have COM-based applications resident on their networks, this move is expected to relieve many deployment and management headaches associated with keeping applications up and running.

Microsoft is not the only vendor talking about object management via directory services. Netscape Communications Corp. last week rolled out Directory Server 3.0 with the underpinnings for a distributed object store for components based on the Object Management Group's Common Object Request Broker Architecture (CORBA).

However, the naming services that will allow CORBA components to dynamically locate each other via the Netscape directory will not be ready until the next release of the product later this year.

Likewise, Novell, Inc. is working on software that provides a simple directory interface to CORBA ORBs, said Dave Clare, director of product management for Novell's developer services division. This technology will allow a CORBA ORB to call Novell Directory Services (NDS) about any object it needs to run an application.

Clare said Novell also has developed prototype code for storing information about COM objects in NDS. "We have software that dredges the desktop registries for COM objects so that we can locate them using NDS. But the process is not pretty because the COM interfaces are not completely open," he added.

Clare would not comment on delivery dates for CORBA or COM support for NDS.

The current COM dilemma

Most problems with managing distributed COM-based applications arise because all information about where client-side components can locate COM servers is stored in the registry of every local 32-bit Windows machine, said Don Box, co-founder of Developmentor, a consulting firm focused on COM and NT development in Torrance, Calif.

For example, a financial application running on a Windows 95 machine can require updated stock information to be collected by another COM object residing somewhere else on the network.

The client component would check with the local registry for a pointer to the COM server's location.

If the client cannot find the necessary COM server object, the application will not run properly. Therefore, under the current setup, an administrator must manually update every client registry if the server object is moved to another network location.

"That is a restriction on how widely people are going to want to deploy these applications," Box said.

Touching every desktop running distributed applications is not a simple procedure, said Bran Mallow, an engineer with the Tampa, Fla.-based systems integrator, Integris Corp. "If there were Yellow Pages for objects, management of these kinds of programs would ease up significantly," Mallow said.

NT 5.0 and the Active Directory should go into beta late this summer.

In a related announcement, Hewlett-Packard Co. and Digital Equipment Corp. announced their intent to provide Microsoft's COM technology, including its distributed networking features, across several operating systems before year-end. The targeted operating systems include HP-UX, and Digital Unix and OpenVMS. ■

Directory services

Microsoft, Cisco tie directory knot

Cisco to implement Active Directory on Unix.

By Christine Burns
Las Vegas

Cisco Systems, Inc. and Microsoft Corp. last week signed a multifaceted agreement to establish the yet-to-be-released Windows NT 5.0 Active Directory as a global networking service.

Under the terms of the deal, Cisco will license Active Directory technology. In addition, the two companies will work together on extensions that tie the technology to Cisco's Internetworking Operating System (IOS).

Allchin *says you can count on Active Directory.*

Also, Cisco and Microsoft will collaborate on an Active Directory implementation of various Unix flavors.

Officials from both companies said this integration will make it possible for network managers to control how IOS services are delivered to individuals or groups of users.

For example, an administrator could use Active Directory to define how much bandwidth individual users can get in order to run multimedia applications. The graphics department in a publishing firm, for instance, could be given more bandwidth than the accounting department.

"By unifying control of the network with Active Directory, we are creating a standard directory that everyone can count on," said Jim Allchin, senior vice president of Microsoft's Personal Desktop and Business Systems division.

Microsoft joins both Novell, Inc. and Netscape Communications Corp. in the global directory arena with this announcement.

"Microsoft has completely validated the Novell business plan by changing their own business plan to react to it," said Michael Simpson, director of marketing for Novell's Internet Infrastructure division.

The difference between Novell's and Microsoft's strategy is that Novell Directory Services (NDS) is already shipping. "They're announcing their intent to collaborate on a thing that won't ship for a year," Simpson said.

Novell has licensed NDS to Hewlett-Packard Co., The Santa Cruz Operation, Inc. and Sun Microsystems, Inc.

Additionally, Novell has partnered with AT&T, Japan's Nippon Telegraph and Telephone Corp. and Deutsche Telekom on outsourcing services that use NDS to tie global networks together.

But industry observers noted that Novell will need to team up with a company such as Cisco to establish better ties to the physical network layer.

"The game's not over yet, but certainly this is a big win for Microsoft. Novell has to prove itself capable of making equal partnerships if it's going to stay [in that space]," said Jamie Lewis, president of The Burton Group, a consultancy in Salt Lake City.

NT 5.0 Active Directory will ship sometime next year. Allchin said Active Directory on Unix will ship 90 days after the NT 5.0 version. ■

Microsoft TechEd tidbits

While Microsoft Corp. did not use its annual TechEd conference, held in Orlando, Fla., last week, to roll out a slew of new products, the company did offer several interesting news tidbits that span its product lines.

Java moves

Microsoft officials said they plan to make the company's Java Virtual Machine available for the Unix and Windows CE platforms by year-end.

Touring Memphis

In a prebeta demonstration of the next version of the Windows 95 operating system, code-named Memphis, Microsoft showed attendees some things they had never seen before. Topping the list was support for multiple displays from a single CPU. This allows a user to click and drag windows among several different monitors.

This version also will allow users to vary screen resolutions for different monitors, a feature that could be useful in developing Web pages to be viewed by all types of monitors.

The Memphis beta will go out to 10,000 customers in about a month and will be released to manufacturers in the fourth quarter.

Tool time

Paul Gross, recently appointed vice president of Microsoft's tools division (see Borland, page 1), took the opportunity to give developers an idea of how the company will improve on the month-old Visual Studio 97 bundle of development tools.

He said the company's direction for the suite includes an increase in rapid application development capabilities, a more unified common development environment, simpler component building, the extension of visual development from Active Server Pages to Dynamic HTML and scripting, and more team development capabil-ities.

—Christine Burns

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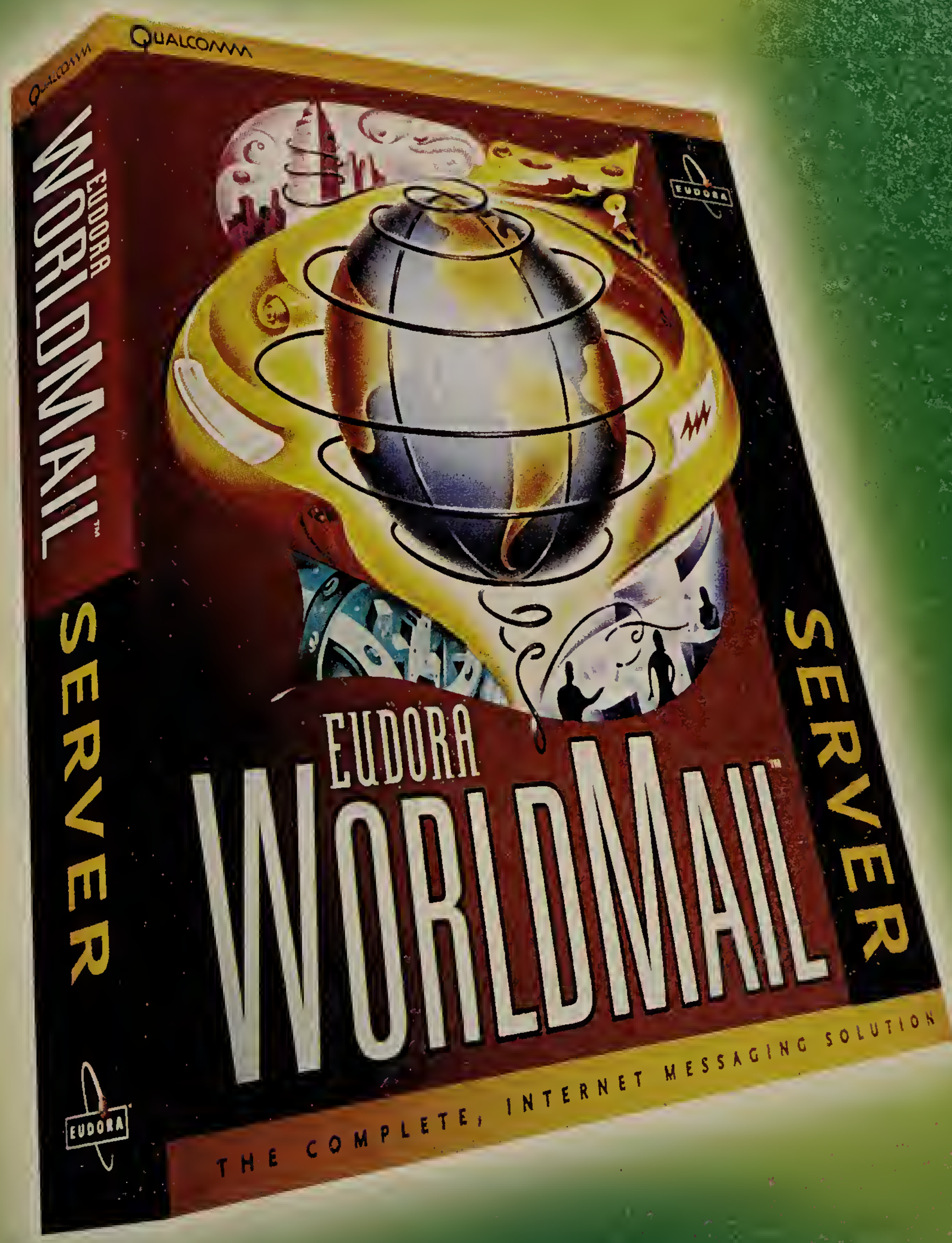

East loses to West in trivia contest

By Todd Wallack

Las Vegas

East last week met West at NetWorld+Interop 97, and the West won.

A team of network executives from the West Coast edged out the East Coast team in the first annual NetBowl, a network trivia contest sponsored by *Network World.* The final score was 150 to 130.

The West Coast team included Rick Gilbert of ADC Kentrox; Christine Hemrick of Cisco Systems, Inc.; Tom Lyon of Ipsilon Networks, Inc.; and Eric Schmidt of Novell, Inc. The East Coast team comprised Howard Anderson of The Yankee Group; Frank Ingari of Shiva Corp.; Eric Cooper of FORE Systems, Inc.; and Tom Evslin of AT&T.

Questions ranged from identifying the first company Cisco acquired (Crescendo Communications, Inc.) to correctly spelling the name of Netscape Communications Corp.'s vice president of technology (Marc Andreessen) to naming Sandra Bullock's character in "The Net" (Angela Bennett).

Gilbert won applause for answering the latter question, but most of the laughs came as industry leaders struggled to answer questions about their own companies. Schmidt, who worked at Sun Microsystems, Inc. for years before he became Novell's CEO in March, could not name the canine breed of Sun's mascot, Network — a Greater Swiss Mountain dog. He did, however, pick the year Novell's NetWare was introduced: 1983.

Winners received trophies. Losers received copies of *Networking for Dummies* by Doug Lowe.

Still, some grumbled about the game. Panelists were not penalized for wrong answers, for example. And some questions were unclear. For instance, one asked how many working groups were in the IETF. The answer was based on the number of topic areas.

Another asked when the White House went online. The network gurus could not figure out whether the question referred to the World-Wide Web or E-mail. ■

First Network World/Interop NetBowl *pitted East Coast net execs against West Coasters in a net trivia contest.*

JEFF SCHEID

REPORTER'S NOTEBOOK, INTEROP STYLE

An earful of dial tone

Tom Lyon, chief technical officer and founder of Ipsilon Networks, Inc., told conference attendees he wanted to give them something to digest as they exited his keynote address, IP Dialtone: Ubiquitous Connections for Ubiquitous Computing. True to his word, a package containing three fortune cookies awaited attendees exiting the ballroom.

PHOTO BY DAVID POWERS

Cracking open the cookies revealed the following words of wisdom to help you through your daily existence:

"You will be connected. Resistance is futile."

"On the real Internet you don't get busy signals."

"bandwidth@home>bandwidth@work."

Skulkin' around

Microsoft Corp.'s invitation-only press/analyst event at the Alexis Park Resort didn't stop an uninvited guest or two from crashing the noon luncheon party. While Microsoft and Cisco Systems, Inc. chronicled their alliance over directory services, a product manager from rival Netscape Communications Corp. listened attentively from his linen-covered round table, taking notes in a vinyl binder emblazoned with the Microsoft logo that the company gave to each guest.

The Netscape product manager's quick getaway, however, was spoiled for several minutes by the parked shuttle bus that would return the invited guests to the convention center. And that was just long enough for *Network World* to catch up with him in his cab.

So just how did he manage to sneak into a press-only event?

"You don't want to know," he said. *"You don't want to know."*

With Microsoft staffers stationed at every table, how did he manage to go undetected?

"They didn't recognize me," he said.

Rumor has it a Novell, Inc. spy also made it into the luncheon.

Vegas

Continued from page 1

"Everyone's talking about faster performance," said Jason Dessel, a network analyst with Universal Studios.

If only everyone agreed on the answers. With so many companies pitching products, some vendors went to extremes to grab attention.

Northern Telecom, Inc. planted a couple of Indy 500 race cars in its booth. Novell, Inc. had a bright red humvee parked outside. Mylex Corp.'s new Network Power & Light division offered reporters helicopter rides over the Hoover Dam. Food, buttons and other freebies were everywhere.

But some took a low-key approach. "We're actually having an air-conditioned meeting room," one vendor boasted.

The pitch might have worked better on Monday, when exhibitors first set up the booths in 93-degree heat. Because boxes were still being trucked into the convention hall, organizers could not close the doors and crank up air-conditioning.

Marketers sweltered, and technicians even had to shut down the Interop network after boxes started to fail.

Interop also featured a full lineup of big-name speakers. Marimba CEO Kim Polese, for instance, blasted PointCast, Inc. and other push vendors for a host of sins she labeled "bad push." Specifically, she said, they often hog bandwidth and disk space, make it hard to deinstall their programs, give viruses easy access to networks and waste users' time.

David House, chairman, president and CEO of Bay Networks, Inc., raised eyebrows when he suggested Bay could become the Compaq Computer Corp. of the network industry. House, reminding the audience he really is not from the network industry, said he thought networking was becoming "PC-ified."

Like IBM, which stumbled trying to develop its own PC operating system in the late 80s, House said he thought 3Com Corp. and Cisco Systems, Inc. were erring by developing proprietary network hardware. Like Compaq did in the PC industry, House thought Bay could maneuver to become the industry leader by improving existing standards.

But the pitch might have fallen short. The next day, *USA Today* said Bay was almost as troubled as Apple Computer, Inc. Indeed, even House's demonstration went haywire.

First, he accidentally clicked on a golf game. Then when he tried to surf the Web his computer froze.

Other vendors tried to play it hip. Novell's "Rock the Net" slogan was tossed round so much someone asked CEO Eric Schmidt if he loves MTV.

Meanwhile, Shiva Corp. had three Generation Xers beating aluminum garbage cans under the billboard "Rock Your World."

There were other weird moments in the show: Merchants selling denim "Born to network" shirts and Interop network managers hanging the Pink Panther from the rafters as a mascot. But perhaps the strangest moment was when the Father of the Internet started doing the Macarena.

Vint Cerf was on the keynote stage, chatting with Interop founder Dan Lynch, when a shrill alarm went off. "The alarm is being investigated," a tape-recorded voice sounded.

The sound continued to blare through the convention hall intermittently for the next 20 minutes until the disembodied voice said, "There is no emergency." At least twice.

But in the meantime, Cerf was killing time. He cracked jokes. He swayed to the alarm.

"Do you tango?" he asked.

"There's not enough beat to dance," Lynch replied. But it did not stop Cerf, even in his trademark three-piece suit. Minutes later he jumped up, did a little jig and then the opening moves of the Macarena. ■

The Glitz. *Show goers were regaled with juggling acts, virtual reality demos and Mae West look-alikes.*

JEFF SCHEID

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Universal

Continued from page 1

user organizations. "Now it's going to take years, if not decades, to build out [alternative] local networks."

Carl Wood, communications and operations manager at Hudson Foods, Inc. in Rogers, Ark., agreed that the FCC needed to cut per-minute access charges substantially more to change the telecom landscape. "I think access charges are ludicrous right now," he said. Wood saw no signs of the long-distance carriers entering the local market in his area because "there's too little margin for them. The price points are just not there."

Critics said the FCC could only do so much to reform the rate structure because it also established a $2.25 billion-a-year fund to help schools, libraries and certain health care organizations obtain Internet access and common carrier services.

In one particularly ironic fallout in helping schools go online, the FCC imposed on residential customers what some decried as an indirect "modem tax." Specifically, the agency raised the federally required subscriber line charge on second residential phone lines. Under the action, users will pay $5 instead of $3.50 per month for a service frequently used for data access.

The FCC's actions followed a wave of lobbying activity that was extraordinary even by telecom industry standards, including an ad campaign by MCI Communications Corp. virtually accusing local carriers of stealing money out of users' pockets.

Just under the wire

The FCC's actions implement the last major requirement of the Telecommunications Act of 1996. The act required the FCC to change the way the nation pays for universal service, the practice of guaranteeing every residential customer phone service at reasonable rates.

FCC officials had said they would not revise universal service without also lowering access charges, the fees paid by long-distance carriers to local carriers to originate and terminate calls. But at the same time they were lowering these per-minute fees, they had to come up with money to fund school subsidies.

The result is a monthly fee of $2.75 per line, charged to the long-distance carrier for every business local exchange line for which it is designated the presubscribed long-distance carrier. Carrier executives indicated that they are likely to pass the fee along to users.

The damage could have been worse. The original proposal floated by the FCC called for a monthly charge starting at $4.50 per line, eventually rising to $6 per line (*NW*, April 28, page 8). But in a meeting last Monday between Moir, FCC Chairman Reed Hundt and several agency staffers, the FCC agreed to reduce the new fee. Users also pointed out that the fee is in addition to an increase in the $6-per-month federal subscriber line charge, plus adjustments in required fees for ISDN lines, starting July 1 (see graphic).

Several regional Bell operating companies said local phone rates might have to go up to replace money lost in reduced switched access charges. ■

No free lunch

The changes in fixed monthly line charges under the FCC's new rules:

Type of charge	Old rate	New rate
Subscriber line charge (SLC) for multiline businesses*	$6.00	$9.00
SLC for first residential line	$3.50	$3.50
SLC for second residential line	$3.50	$5.00
Primary interexchange carrier (IXC) charge for businesses	Did not exist**	$2.75
Primary IXC charge for second residential line	Did not exist**	$1.50
SLC for ISDN Primary Rate Interface	1 or 24 times analog SLC***	5 times analog SLC
SLC for ISDN Basic Rate Interface	1 or 2 times analog SLC***	$5.00****

* Maximum charge; actual rate varies per federal formula.

** No charge directly imposed on users, but IXC currently pays 53 cents per line into universal service.

*** Officially users have had to pay for each bearer channel, but that rule has been under a federal waiver for two years.

**** Preliminary information from the FCC is that BRIs will be treated the same as second residential lines, even if they are at a business location.

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FAQ on FCC decision

By David Rohde

Once again, the Federal Communications Commission has issued a giant set of new rules that leave the regulators exhausted, carriers grumbling, congressmen peevish, and users wary and confused. Here, in Internet FAQ style, are answers to the principal questions raised by the commission's action:

How do the access charge reductions work?

For the past few years, the major local carriers have had to reduce their access fees every July 1, by a percentage known, strangely enough, as the X Factor.

Last week, the FCC raised the X Factor for all major local carriers to 6.5%. The FCC calculates that will result in an aggregate $1.7 billion reduction for the coming year.

Will those translate into big long-distance rate reductions?

No. Business lobbyists wanted an 8% X Factor or higher, which would have sliced another couple billion off the charges. The lobbyists also wanted the FCC to force the local carriers to make additional access charge reductions if their profits exceeded a certain level. The FCC refused to do that and, in fact, eliminated once and for all any rules restricting local carriers' rate of return.

How much will the increase in the subscriber line charge (SLC) affect my company?

The FCC raised the charge 50% — from $6 to $9 per month — but those are really caps. The actual calculation on which the business SLC is based averages $7.61 per month, depending on a typically complicated federal formula. So while the current $6 cap had the effect of being the actual rate for many users, most users will not actually see a full 50% increase.

So the SLC is going up some, and a new charge of $2.75 per month per line is being imposed on July 1. Is that really a big deal?

Actually, FCC officials claim that large businesses should come out ahead because the new charges will be more than offset by presumed cuts in long-distance toll rates resulting from access charge reductions. The problem is that, for users, the new line fees are hard costs, while the toll rate reductions have to be negotiated.

Did the FCC do enough on access rates to convince AT&T to speed up its plans to enter local markets?

No. Even FCC officials admit those rates are still inflated. They claim their plan overall will bring access rates down to about a penny a minute but not for several years, especially for originating access.

Why should the level of access charges affect AT&T's entry into local markets? If AT&T built its own local network, wouldn't it avoid regional Bell operating company access charges entirely?

Yes, it would, but AT&T officials say there's more to it than that. They claim under any conceivable rollout schedule, while they built or leased a new network in one state, they would still be paying inflated access charges to the same RBOC in all its other states. The RBOC could then use that money to crush AT&T's local marketing efforts via advertising, promotional deals or other tactics. AT&T's critics claim that is hokum, since the long-distance carrier has hesitated too long to spend its billions to enter multiple markets at once — an action that is unlikely soon, given AT&T's depressed stock price and current corporate upheaval.

Will the FCC be sued over the new rules?

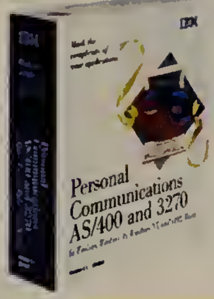
As day follows night, a lawsuit is inevitable. What is not yet clear is whether the commission will be sued by major players or specialized interests. For example, the paging industry flipped out immediately after the decision because they will be required to pay into the universal service fund for the first time.

Would the FCC win or lose in court?

It is anyone's guess, but the FCC has a lousy record in the courtroom. Both the agency's network-interconnection pricing rules and its order abolishing long-distance tariffs have been stayed by courts.

Everyone always seems to be mad at the FCC. Did they just blow it when it comes to telecom reform?

No, that is not a fair assessment. The problem is that Congress handed the FCC a 280-page bill that called for the commission to crack open monopolies, expand universal service, put schools on the 'Net — and still guarantee reasonable rates for everyone, all at the same time. That is probably not possible. ■



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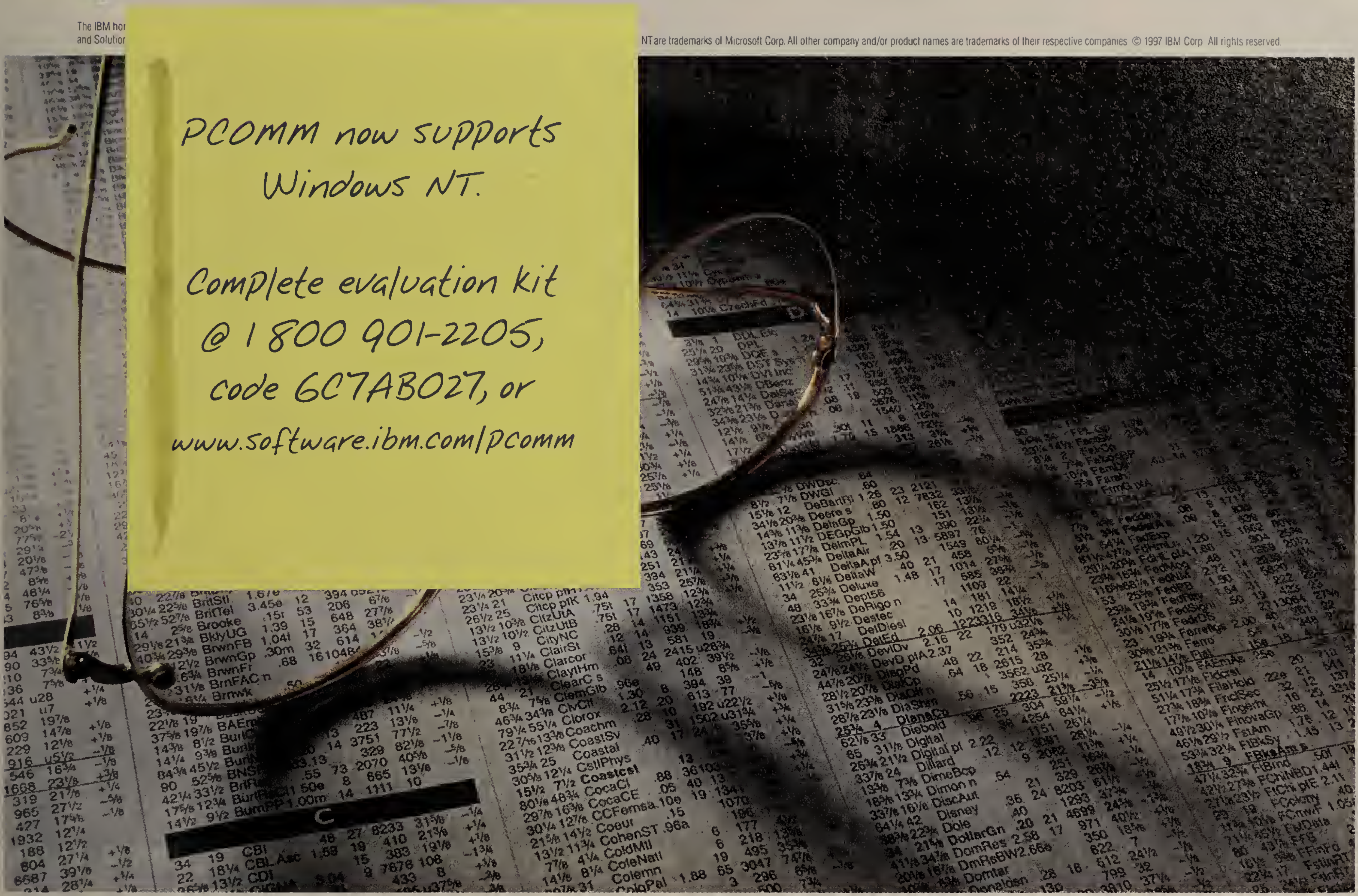

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WANs & Internetworking

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Briefs

■ **Micom Communications Corp.** *recently announced that its V/IP gateway product supports Microsoft Corp.'s NetMeeting 2.0, allowing users to* **phone each other over IP networks** *as well as to call off the network.*

© Micom: (805) 583-8600

■ **U.S. Robotics (USR)** *last week at NetWorld+Interop 97 introduced LANLinker Dual Analog, a product with two* **x2 56K bit/sec modems** *for dial-in/dial-out support of remote office IP, IPX and AppleTalk LANs.*

The router includes Password Authentication Protocol, Challenge Handshake Authentication Protocol and Remote Authentication Dial-In User Service security.

The router also supports Stac, Inc., Microsoft Corp. and Ascend Communications, Inc. compression.

Available in the third quarter, LANLinker Dual Analog will be priced at less than $795.

© USR: (847) 982-5010

■ **Adtran, Inc.** *last week introduced a line of remote access chassis, called Embedded SNMP Plus (ESP), that includes hardware modules to support several* **remote connectivity** *backup options.*

The ESP boxes can be configured with T-1, digital data service (DDS) or frame relay wide-area links. To back up those links in case they fail, ESP hardware modules can be installed to support a V.34 analog modem, switched 56 or ISDN.

A separate card has two telephone interfaces that allow users to drop telephone traffic onto a remote frame relay link.

The DSU IV ESP for a DDS connection costs $795. FSU5622 ESP supporting frame relay costs $1,145. TSU ESP supporting T-1 costs $1,345.

Option cards include: voice over frame relay, $745; ISDN dial backup, $555; switched 56 dial backup, $400; V.34 dial backup, $655. An Ethernet SNMP access card costs $195.

© Adtran: (800) 326-3700

Dial-up gear blazing new trails

By Tim Greene
Las Vegas

Two vendors were pushing the remote access envelope at NetWorld+Interop 97 last week, unveiling tools that offer more secure access to corporate networks for more users. And by supporting 56K bit/sec modems and ISDN, the tools also offer more speed.

The new Chase Research PLC and Lantronix remote access hardware products range from four to 32 ports, but all include high-speed analog and digital dial-up support.

Lantronix introduced Lantronix Remote Access Server 32 (LRS32F), a 32-port central site server that supports 230K bit/sec from each port and features a 10M or 100M bit/sec Ethernet LAN connection. The serial port speeds are designed to meet growing remote access bandwidth demands of faster analog and digital links such as dedicated access lines terminated in stand-alone DSUs/CSUs.

LRS32F is a router with packet filtering that lets managers control applications going over a particular link. The manager could restrict incoming calls from hitting a file server or prevent dial-out access to the 'Net.

IOLAN 4.0, *a new version of Chase's communications server, adds authentication, accounting and modem pooling.*

Those restrictions would be supported by Password Authentication Protocol, Challenge Handshake Authentication Protocol, Remote Authentication Dial-in User Service, Kerberos and SecurID security features. Dial-back security can also be supported.

To save on dial-up costs, the LRS32F can be configured to time-out after a period of inactivity. It also can perform IPX spoofing to shut down links when essential traffic is not being sent.

Meanwhile, Chase Research introduced ATFAST-PCI, a card for PC-based servers running Windows NT or Unix. It supports port speeds of 460K bit/sec, fast enough to handle 56K modems or ISDN. It comes in four-, eight- and 16-port configurations.

Chase also unveiled IOLink, a frame relay router supporting IP and IPX for intranets and LAN-to-LAN routing. It can be configured with one or two wide-area ports supporting up to 2M bit/sec each. IOLink supports compression and can throttle back transmission speeds in response to network congestion.

Chase has also come up with a print server that supports 100M bit/sec Ethernet, letting users upgrade to faster servers on LAN segments with 100M bit/sec Ethernet. IOPrintFast can simultaneously support 10M bit/sec segments.

Meanwhile, a new version of Chase's communications server, IOLAN 4.0, adds authentication, accounting and modem pooling. It comes with eight or 16 ports.

Lantronix's LRS32F is available this month and costs $3,395. Chase Research's ATFAST-PCI is also available this month for $149 for four ports. IOLink is available now and costs $3,995. IOPrintFast is available this month for $549. IOLAN 4.0 is available this month and costs $1,595 for eight ports.

© Lantronix: (800) 422-7055; Chase: (615) 872-0770

Cisco blends TCP/IP and SNA

By Michael Cooney
Raleigh, N.C.

Cisco Systems, Inc. hopes to help users build ever-larger mixed TCP/IP and SNA networks.

The company last week announced enhancements to its Data Link Switching Plus (DLSw+) software that promise to reduce broadcast traffic over wide-area nets, simplify net configurations and help users more easily prioritize SNA traffic traversing their corporate TCP/IP backbone.

DLSw is the industry standard technology that lets SNA and NETBIOS traffic flow through a TCP/IP net. DLSw+ is Cisco's implementation and extension of the standard it deploys in its Internetwork Operating System-based router family.

With the announcement, Cisco adds DLSw Version 2 functionality to DLSw+. Version 2 is the latest standardized version of DLSw and adds a number of new features. For example, Cisco routers with Version 2 support can deploy a new IP Multicast technique among multiple remote branch offices that forwards only specific data onto the backbone. The feature reduces the traffic those locations need to send across the WAN.

For its DLSw+ implementation, Cisco added two new features: border peer caching and SNA Type of Service (TOS).

Border peer caching lets Cisco routers automatically build a distributed directory of SNA and NETBIOS resources. This way, broadcasting only occurs the first time a branch router requests information from other routers to find a networked resource. With the information in the directory, requests are forwarded directly to the correct site, reducing broadcast traffic on the WAN.

This feature, plus the DLSw Version 2 support, will enable companies to add more users and remote sites to their IP backbones without incurring performance problems, analysts said.

"If users were going to deploy DLSw in a major way, it had to be more scalable than it is today, and these enhancements do that," said Anura Guruge, an independent analyst based in New Ipswich, N.H. "As SNA users set up more intranets, DLSw will become more important."

Finally, Cisco's TOS preserves SNA traffic prioritization across the IP backbone. TOS maps SNA Class of Service routines to the TCP/IP header guaranteeing delivery of mission-critical SNA data.

All of the new features will be available in June. Pricing was not announced.

© Cisco: (408) 526-4000

DLSw + FUNCTIONALITY COMPARISON

Function	Feature	DLSw	Cisco DLSw+
Transport	TCP	X	X
	Direct HDLC/LLC		X
	Direct RFC 1400		X
Media conversion	SDLC to LLC2	X	X
	LLC2 to SDLC		X
	QLLC <-> LLC2		X
	QLLC to SDLC		X
Performance	Flow control	X	X
	Custom queuing		X
	Prioritization	X	X
	Load balancing		X
Scalability	Caching		X
	RIF reduction		X
	Peer groups		X
	On-Demand peers		X

Key:
HDLC: High-level Data Link Control
QLLC: Qualified Logical Link Control
RIF: Routing information field
LLC: Logical Link Control
SDLC: Synchronous Data Link Control
RFC: Request for comment

www.nwfusion.com

Get more info online:
- DLSw Version 2 details
- DLSw primers and overviews

NetworkWorld Fusion

INTERNETWORKING MONITOR

Token ring: Who will lead?

Dear Kevin,

"I read your April 28 *Network World* column, 'Token ring: A market spooked,' and it struck a chord."

So began the first of many messages I received almost immediately after my last column hit the streets. All of the writers concurred with my analysis that, by and large, vendors currently are mishandling the token-ring consumer. Managers of token-ring networks clearly are ready to follow a dynamic leader.

But who will lead token-ring customers into the future? Let's look at each vendor.

3Com Corp: Though a relative latecomer to the token-ring world, the company's position as the No. 2 networking firm makes it very influential in large accounts. Innovative token-ring and Fast Ethernet integration switch options, as well as WAN support for token-ring-centric approaches such as Data Link Switching enhance 3Com's position.

Bay Networks, Inc.: Through its SynOptics Communications, Inc. hub business, its Wellfleet Communications, Inc. router line and its recent Centillion Networks, Inc. switch acquisition, Bay has a lot of token-ring ports out there. We'll have to see where token ring falls in the company's newly announced "Adaptive Networking" strategy.

Cabletron Systems, Inc.: Like Bay, Cabletron has shipped large amounts of token-ring hub ports. With the acquisitions of Standard Microsystems Corp.'s enterprise switch division and Data Link Control's Synchronous Conversion vendor Netlink, Inc., Cabletron continued moving into the token-ring space.

Cisco Systems, Inc.: Though plagued earlier by an "all over the map" token-ring switch strategy, Cisco's influence in enterprise accounts these days is unmatched. Leveraging a technology partnership with Olicom A/S, Cisco finally is set to introduce what it considers the first token-ring switch that will satisfy the needs of enterprise customers.

Kevin Tolly

IBM: With token ring, do not count out IBM. After much shifting, IBM's networking division is being rejuvenated. With a new vice president of marketing, recently snatched from Cisco, perhaps we'll see IBM adopt a more aggressive and proactive approach. Tending to existing token-ring customers would be an ideal place to start.

Madge Networks, Inc.: Always associated with high-quality, high-performance token-ring products, Madge in recent years seemed more concerned with growing other parts of its business. Acquisitions caused Madge's scope to broaden and become less token-ring-centric.

Olicom: Olicom has always been recognized as a leader in the token-ring switch market. The company bet heavily on ATM, however, and came late to the token-ring switch market. The recent acquisition of CrossComm Corp. places Olicom in the ranks of enterprise-level vendors. For the companies' existing customers, the new Olicom will need to make some clear statements on token ring.

Finally, the leadership of the Alliance for Strategic Token Ring Advancement and Leadership must decide whether to disband or rejuvenate. Its current "barely alive" status helps no one.

Vendors, what do you think?

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (908) 528-3300 or via the Internet at ktolly@tolly.com.

NetworkWorld
TECHNICAL SEMINARS

IPv6
THE NEXT GENERATION FOR TCP/IP INTERNETWORKS

The next generation of Internet Protocol — IPv6 — will significantly impact your TCP/IP network. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities. The addressing issue has been one of the most significant concerns as it was predicted that the Internet community would run out of available addresses, thus limiting the growth of this critical communication resource.

In late 1990, the Internet Engineering Task Force (IETF) initiated efforts to select a successor to the IP. In late 1993, the IETF formed the Internet Protocol – Next Generation (IPng) working group, which was chartered with investigating the various proposals, and recommending a course of action. The outcome of those efforts produced what is now known as IP version 6 (IPv6), which is currently being implemented by many vendors.

Perhaps more importantly, IP is the foundation of the TCP/IP protocol suite. Therefore if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and application programming interfaces.

Whether you are a network manager, designer or software developer, this seminar, taught by internetworking expert Mark Miller, will provide you with information on the widespread ramifications of this new protocol. You will learn how to effectively plan and implement a successful, orderly transition.

12 TOPICS YOU DON'T WANT TO MISS!

1. Learn how the implementation of IPv6 will allow continued expansion of the global Internet
2. Explore the effects of IPv6 on other elements of your internet or intranet architecture
3. Understand the limitations of the current Internet Protocol — IPv4
4. Discover key features of IPv6, including larger addresses and security
5. Learn details of the proposed IPng solutions: CATNIP, TUBA and SIPP
6. Understand the key functional and protocol enhancements incorporated into IPv6
7. Analyze the formats of the IPv6 packet header, Extension headers, ICMPv6 messages and Neighbor Discover messages, and others.
8. Gain detailed insights into how the IPv6 transition will affect other protocols, such as Ethernet, token ring, RIP and OSPF
9. Learn how to strategically plan your transition from IPv4 to IPv6
10. Learn how leading vendors such as Bay Networks, Cisco Systems, Digital, FTP Software, Sun and others are implementing IPv6
11. Learn about the 6Bone — a worldwide IPv6 network
12. Discover how to obtain public domain sources of further information on IPv6

Enterprise Network Management
Understanding SNMP, SNMPv2 and RMON

With the explosive growth of enterprise internetworks, the need for integrated network management systems to help simplify management operations has never been greater. Today's enterprise network management systems need to manage thousands of elements — from the hardware devices all the way to the applications and processes running on these networks.

SNMP (Simple Network Management Protocol) has become the de facto standard for end-to-end enterprise network management. Recent enhancements to the SNMP-based technology, including SNMPv2, RMON2 and Web-based management tools, improve this popular system. With those enhancements, however, come additional challenges for the network manager.

This one-day, information-packed seminar, taught by internetworking expert Mark Miller, will help you understand the elements of an SNMP-based network management system, how to implement SNMP with your internetwork, plus the various enhancements such as the new message formats and improved error codes provided with SNMP version 2. You will learn about recent enhancements to the Remote Monitoring (RMON) network management architecture, known as RMON2, and the advantages of implementing RMON throughout your internetwork. In addition, you will see how SNMP is being used to manage broadband networks, including frame relay, SMDS and ATM.

You will also be introduced to the next generation of network management: Web-based tools that integrate SNMP and browser technology. This new technology consists of three components: network management software which runs on a Web server, proxy agents which operate on the managed devices, providing updates to the Web server, and a browser-equipped workstation that can access those management details from any location within the enterprise.

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ATTENDING THIS SEMINAR WILL HELP YOU . . .

1. Understand the Agent/Manager model of network management
2. Compare and contrast the ISO, IEEE, DMTF and Internet network management architectures
3. Discover the next-generation architecture of enterprise management tools: the Web-based managers and agents
4. Understand the key components of the Web-based Enterprise Management: the HyperMedia Management Schema (HMMS), the HyperMedia Object Manager (HMOM) and the HyperMedia Management Protocol (HMMP)
5. Learn the details of the key elements of the Internet Network Management framework: the SMI, the MIB and the SNMP
6. Discover how existing Web-based enterprise managers and existing SNMP-based devices can be integrated into a cohesive system
7. Understand the enhancements found in SNMPv2, plus the proposed security enhancements: SNMPv2u and SNMPv2*
8. Survey the key elements of Abstract Syntax Notation One (ASN.1), the language used to define SNMP message formats
9. Understand the key differences between the RMON and RMON2 standards for remote management of the enterprise
10. Consider strategies for the coexistence of SNMP version 2 with existing SNMP version 1 systems

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- *Comprehensive seminar workbook*
- *Copy of Troubleshooting TCP/IP, 2nd Edition, by Mark A. Miller, P.E.*
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IPv6 SEMINAR	CITY	SNMP SEMINAR
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3/11/97	Dallas, TX	3/12/97
4/3/97	Washington, DC	4/4/97
4/8/97	New York, NY	4/9/97
4/23/97	Boston, MA	4/24/97
5/13/97	Atlanta, GA	5/14/97
5/28/97	Chicago, IL	5/29/97
6/10/97	San Francisco, CA	6/11/97
6/17/97	Irvine, CA	6/18/97
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- *Four exclusive protocol reference guides: SNMPv1, SNMPv2, RMON and RMON2 MIBs*
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Carrier Services

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Briefs

■ **The North American Numbering Council** *on Thursday will announce its selection for the* **administrator** *of U.S., Canadian and Caribbean phone numbers.*

The four candidates are Bellcore, the current administrator; the Center for Communications Management Information, a rate and tariff analysis firm; defense contractor Lockheed Martin Corp.; and Mitretek Systems, Inc., a provider of energy, environmental and health care systems.

Bellcore, which was sold last year to Science Applications International Corp., must demonstrate it has shed its old Bell company ties to keep the job. The council's selection is subject to approval by the Federal Communications Commission.

■ *In an executive shuffle,* **AT&T** *last week* **replaced its chief information officer,** *Ron Ponder, with its network IS chief, Frank Ianna. In his new position as executive vice president of Network and Computing Services, Ianna will oversee AT&T's current $8 billion to $9 billion network upgrade (*NW*, March 24, page 8). Ianna also will oversee the company's attempt to develop a single bill for mass-market customers who order long-distance, wireless, Internet and, potentially, local services. Ponder was reassigned to a job coordinating AT&T's network architecture with those of overseas partner carriers.*

AT&T's *Ianna*

■ **AT&T** *withdrew an application to the Federal Communications Commission to construct, launch and operate 12 geostationary satellites.*

The original idea behind the 1995 plan was to provide new kinds of global multimedia services. But AT&T said the plan would **eat up too much capital** *at a time when it needs to concentrate on its core business.*

LCI rate bundle bars increases

Carrier pulls together voice and data services on single discount contract.

By David Rohde

McLean, Va.

Upstart carrier LCI International, Inc. is upping the ante on bundled services with a combined voice and data contract that bars rate increases.

LCI last week introduced Simply Guaranteed Plus, an offering that combines telecommunication staples such as outbound and inbound calling with private lines and frame relay service, on the same contract.

Under Simply Guaranteed Plus, the price paid for each service is based on the total volume a user generates for all of the services.

For example, a user with a total monthly expenditure of $50,000 and dedicated access lines to LCI's points of presence pays 5.9 cents per minute on outbound and inbound calls if the company signs a one-year contract.

That rate drops to 5.7 cents per minute if the total expenditure on all services reaches $100,000 per month and further drops to 5.4 cents if the user signs a three-year contract.

In a radical departure from the practice of larger carriers, the rates are listed directly in LCI's tariff, eliminating the arduous discount negotiations usually required to reach such rate levels.

The rates cannot be changed during the course of the contract, even if the carrier files a general rate increase.

The rates cannot be changed during the course of the contract even if the carrier files a general rate increase.

Without dedicated access lines, LCI's calling rates range from 9 to 12 cents per minute.

With the data services included in Simply Guaranteed Plus, LCI follows the more standard practice of subtracting a discount off a basic rate based on term and volume commitment.

For example, a 64K bit/sec frame relay port costs $190 per month. But a user spending $50,000 per month on all services in a one-year contract receives a 22% discount, reducing the monthly price to $148.20.

Users can boost their volume commitments not only with traditional long-distance services, but also with newer offerings such as Internet access (see graphic).

LCI, which recently hired former U.S. Assistant Attorney General Anne Bingaman to spearhead its drive into the local telephone business, is even offering to add a user's LCI local phone bill to the contract.

However, until now LCI has sold local service mostly to very small businesses on a resale basis.

There is one exception to the rule that LCI cannot raise rates during the course of the contract: additional expenses levied on carriers by the government. Those can be passed along to customers, said Kevin Welch, LCI's director of general business marketing.

One example of such an expense, according to Welch, is the recently enacted federal regulation that forces inbound 800 service carriers to compensate pay phone owners for 800 calls originating at their phones.

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LCI services included under Simply Guaranteed Plus:

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- ▶ Inbound 800/888 (switched and dedicated access)
- ▶ Private lines
- ▶ Frame relay
- ▶ Internet access
- ▶ Broadcast fax
- ▶ Audioconferencing
- ▶ Calling cards

LEC managed frame relay pricing closes in on IXCs

By David Rohde

Local exchange carriers are known for providing frame relay service at prices substantially below those of interexchange carriers.

ENTERING THE FRAY

Pacific Bell's monthly per-node prices for its new frame relay managed router service:

Router model series	Onetime installation fee	Price for 8x5 monitoring	Price for 24x7 monitoring
Cisco 1000 Series	$300	$250	$300
Cisco 2500/3000 Series	$400	$350	$400
Cisco 4000 Series	$700	$400	$450
Cisco 7000 Series	$1,000	$750	$800

8x5 monitoring covers eight hours a day, five days a week. 24x7 monitoring covers 24 hours a day, seven days a week. Term and volume discounts of 12% to 30% are available. Hardware purchase or lease costs extra.

But the price difference can narrow considerably if you add in carrier management of your frame relay network.

The latest local carrier to enter the managed frame relay fray is Pacific Bell, which recently unveiled its FasTrak Managed Frame Services offering.

Pacific Bell's FasTrak managed service employs a simpler price structure than the line-item approach recently instituted by AT&T (*NW*, April 21, page 1). The only catch: Pacific Bell's base prices are higher than AT&T's.

Pacific Bell charges $350 per month for management of a two-port Cisco Systems, Inc. 2501 router — the type often used at branch offices and other sites located away from the data center.

And that price only buys monitoring services for eight hours a day, five days a week.

A request for round-the-clock monitoring bumps the price up to $400 per month.

By contrast, AT&T charges $225 per month for continuous monitoring of a Cisco 2501, though the long-distance giant charges additional fees for management reports and support of multiple LAN protocols.

For management of larger routers, such as those in the Cisco 7000 series, Pacific Bell charges $750 per month for business-day monitoring and $800 per month for continuous monitoring.

Like other carriers, Pacific Bell does not include in these prices the cost of the hardware purchase or leasing and maintenance.

Along with the new managed frame relay service, Pacific Bell also recently unveiled FasTrak View Web 1.0 and joins the growing list of carriers that provide network performance reports online, accessible via a Web browser.

Scheduled to be available in June, FasTrak View Web 1.0 will provide weekly updates of a user's circuit utilization and other frame relay statistics.

The price is expected to be $75 for installation plus a monthly fee of $50 for one user ID and password to the secure system.

An upgrade to Version 2.0 later this year will provide daily updates for no additional charge. ■

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EYE ON THE CARRIERS

Nice case vs. business case

So you thought the internetworking biz was dominated by Cisco Systems, Inc. and its three relentless pursuers: 3Com Corp., Bay Networks, Inc. and Cabletron Systems, Inc.

Well, the telephone industry has spawned two companies that are lusting to join that quartet. Say hello to Lucent Technologies, Inc. and Northern Telecom, Inc.

The 1995 breakup of AT&T has been great for Lucent — but even better for Nortel. The Canadian company had long been viewed as stuck in the boring, low-margin business of making telephone switches. Now it looks strikingly similar to Lucent, one of Wall Street's darlings.

David Rohde

Both Lucent and Nortel get about two-thirds of their revenue from carriers and one-third from users, starting from nearly identical market shares in central office equipment and PBXs. The companies' stock prices have soared because investors think suppliers of telecom gear will sell lots of iron even if some carriers get flattened by telecom reform.

Because of their voice backgrounds, Lucent and Nortel have gone after the data networking market under the umbrella of "multimedia solutions." But that term means something totally different to the two companies.

Lucent officials emphasize how wonderful it would be if users could dial up and share video and data in real time along with a telephone conversation. To do that, Lucent says, requires that telephony features such as hold, conference and transfer be incorporated into computer networks.

The result is Lucent's Multimedia Communications Exchange Server, a box that Lucent has had a devil of a time selling. But that doesn't seem to bother Lucent officials, because — as in their TV ads — they will happily remind you their products come out of Bell Labs, which Lucent grabbed in the AT&T fallout.

Here is a typical sentence from a Lucent briefing: "Our multimedia real-time call-handling collaboration solutions, invented by Bell Labs, will change the Bell Labs corporate paradigm of Bell Labs with users Bell Labs 125 years ago with Alexander Graham Bell Labs." Memo to Lucent executives: Congratulations, you invented the transistor in 1947. Get over it!

To Nortel, multimedia simply means taking existing voice and data traffic — real traffic, the stuff you lose sleep over — and putting it all on the same network infrastructure.

Nortel's story is a bit ATM-heavy and relies on some proprietary compression and trunking schemes that mix up frames and cells. But the result is the Magellan family of switches, which deliver fast-packet efficiencies without the need for separate, constant-bit-rate circuits for delay-sensitive traffic. Voice and data can ride over the same net, cutting out carrier tolls for internal voice traffic.

Go to Lucent and you'll get a purely third-party installation (via its resale of Bay equipment) or a nice case for a complicated multimedia infrastructure. Go to Nortel and you'll get an actual business case for a new WAN design.

Having a business case is probably a more likely path for a vendor to join the internetworking pantheon, don't you think?

Rohde is NW Senior Editor of Carrier Services. He can be reached at david_rohde@nww.com.

Headline:

T1, T3 Fiber Solutions for the Next Generation.

Photo:

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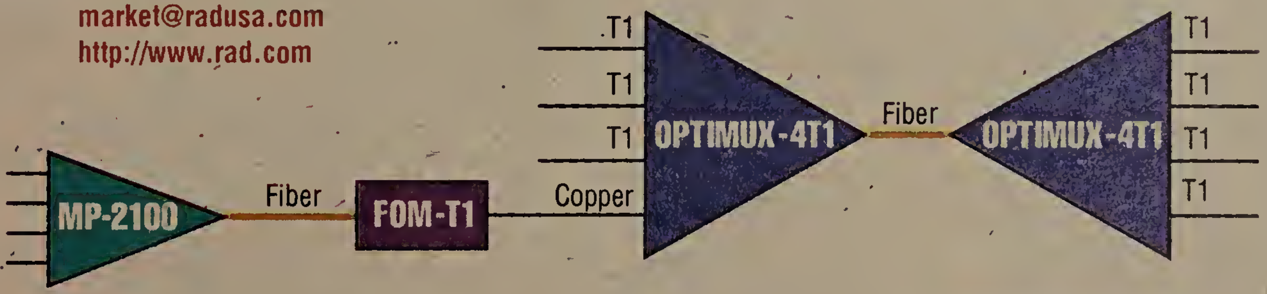

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☐ 51-100 ☐ 251-500 ☐ 1001+

When do you plan to implement a remote access solution?
☐ within 30 days ☐ 4-6 months ☐ 1+ year
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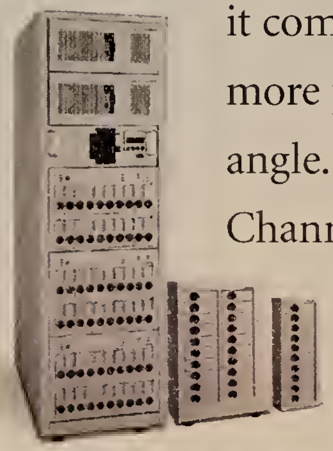

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Local Networks

Covering: Servers • Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ *Santa Monica, Calif.-based* **Osicom Technologies, Inc.** *last week introduced a trio of new* **Ethernet and Fast Ethernet workgroup switches.** *The OS-5008 provides wire-speed switching among eight 10Base-T ports and can support as many as 8,000 media access control addresses.*

The OS-5208 is an eight-port Ethernet switch with two additional Ethernet ports that can operate at 10M or 100M bit/sec.

The OS-7002 is a two-port Fast Ethernet switch, in which one of the ports can also run at 10M bit/sec. The OS-500 costs $795, the OS-5208 costs $1,295, and the OS-7002 costs $650. All products will ship this summer.

■ **Novell, Inc.** *this month will ship a new version of its* **Novell Application Launcher (NAL),** *which provides software distribution for NetWare and IntranetWare networks.*

NAL 2.0 supports Windows 3.X, 95 and NT desktops and provides preconfigured installation templates for popular applications. NAL 2.0 will be available free later this month to all existing customers via www.novell.com.

© Novell: (800) 453-1267

■ *Tustin, Calif.-based* **XCD, Inc.** *has shipped a* **low-cost print server** *that supports all major network operating systems and 100Base-T and 10Base-T networks. The XConnect 100 Select-print server connects up to four printers via its two high-speed parallel ports and two serial ports. It ships with XCD's X-Admin Windows graphical administration utility. The product is available now for $445.*

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Gigabit Ethernet grabs spotlight at Interop

By Jodi Cohen
Las Vegas

NetWorld+Interop 97 and red-hot technologies go hand-in-hand. And this year, there's nothing hotter in Vegas than Gigabit Ethernet.

The technology continued to build momentum last week, as IBM teamed with start-up Alteon Networks, Inc. to provide Gigabit Ethernet server links; G2 Networks, Inc. made its debut as a gigabit clustering technology vendor; and seven vendors separately announced they have completed Gigabit Ethernet interoperability testing.

IBM last week announced it will extend its ATM-based Switched Virtual Network architecture to include servers equipped with Alteon AceNIC Gigabit Ethernet adapters.

Under the agreement, Alteon will license IBM's Multiprotocol Switched Services (MSS) software and integrate it into future AceNIC adapter cards. MSS supports an array of features from routing, traffic management and congestion control to ATM Virtual Channel Connection support.

With IBM's software running on Alteon's adapters, AceNIC-equipped servers will now be able to communicate directly with MSS clients on different subnets without traversing a router. IBM supports MSS in its hubs and routers. Other vendors, such as 3Com Corp., will support it in their products.

In addition to increasing connection capacity to servers, users will be able to reduce server CPU utilization using Alteon's AceNIC, industry observers said. The card returns processing cycles to servers by off-loading CPU-intensive tasks such as TCP/IP checksum calculation.

G2 says 'me, too'

Start-up G2 joined the gigabit gang when the privately held company debuted its first round of network gear designed to link servers and storage equipment on a network. The company plans to develop products that move data at gigabit speeds between computers and network-attached devices.

G2 first will roll out Fibre Channel adapters, hubs and switches this summer, and will unveil a Fibre Channel-to-Gigabit Ethernet bridge in 1988, according to Steven Topper, president and CEO of G2.

NETWORLD+INTEROP 97

The company declined, however, to provide more product details.

Industry interest in G2 is high because many of the folks on G2's management team came from top server and network vendors such as 3Com and Hewlett-Packard Co.

Also, sitting on G2's board of directors is Joseph Marengi, president of Novell, Inc. In fact, G2 already has signed on with Novell as a key partner for its Wolf Mountain clustering technology.

Wolf Mountain will let users link servers via an interconnect protocol and high-speed physical links such as 100M bit/sec Ethernet and ATM.

Put to the test

On the interoperability front, seven companies reported successful completion of tests aimed at showing that their products work together in customer environments.

First, Foundry Networks, Inc. and Packet Engines, Inc. announced that they were able to transmit and receive packets in a joint test of their Gigabit Ethernet products. The test involved Packet Engine's 64-bit PCI Gigabit Ethernet card, the G-NIC, and Foundry's FastIron multilayer switch.

Separately, Packet Engines revealed that G-NIC also works with Acacia Networks, Inc.'s NovaSwitch 10000gx LAN switch.

Not to be left out, Essential Communications, Rapid City Communications and Silicon Graphics, Inc. (SGI) announced that they ran Network File System traffic for the first time over three different Gigabit Ethernet devices. The tests were conducted on Essential's JackRabbit NIC, Rapid City's FIRST f1200 routing switch and an SGI Origin200 server.

Analysts said the testing is significant because it demonstrates that prestandard Gigabit Ethernet products from different companies can work together.

The Gigabit Ethernet standard, which is being developed by the IEEE 802.3z committee, is expected to be completed in early 1998. ■

PROFILE: G2 NETWORKS, INC.

Founded:	November 1994
Based:	Los Gatos, Calif.
Employees:	25
Key technology:	Fibre Channel and Gigabit Ethernet clustering gear
Venture funding:	$6.6 million
Revenue:	Not available, privately held
Products:	Hubs and switches, which will ship this summer

Novell employs directory for user access to Web

By Christine Burns
Las Vegas

In separate announcements last week, Novell, Inc. released details about its plans to use Novell Directory Services (NDS) as the central point of administration for assigning access rights for Web content and host data.

Through a partnership with Microsystems Software, Inc., Novell will provide content-filtering technology in its upcoming Border Services product, which uses NDS to deny a user or group of users access to undesirable information from the 'Net.

Border Services is the code name for an upcoming suite of firewall, proxy caching, virtual private networking, remote access and routing services that Novell is planning to deliver later this summer. The services reside on a single machine that sits between an IntranetWare LAN and the Internet to quickly and securely tie LAN users to Web information and corporate business partners over the Internet.

Novell also unveiled its new Web-to-host connectivity product, IntranetWare HostPublisher. This product, which went into limited beta last week, employs NDS for browser-based user authentication to host resources. It also uses NDS to provide centralized administration of user accounts on the host system and network.

Both announcements reflect Novell's strategy — to use NDS as the central point of administration for all network services. For network administrators, this consistency provides a universal method for managing user access to network information, regardless of where the data lies.

Novell users that have not deployed packages that secure Internet access or build Web-to-host ties were excited by the prospect of controlling access to those services with NDS, a system they are familiar with.

"Anything that has hooks into the directory automatically is interesting to me. I am going to take a real hard look at Border Services for that reason," said Dan Blevins, a technical analyst with Hallmark, Inc. in Kansas City, Mo., who manages a 60-server NetWare 4.X network.

However, Josh Turiel, information technology officer with adlife, Inc. and president of the Greater Boston Network Users

See Novell, page 30

NetworkWorld Fusion

Get more info online:

- A Novell white paper on Border Services
- Overviews of other virtual private networking software

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Novell

Continued from page 27

Group, doubted that NDS integration would be enough to force users to replace the firewall, proxy or Web-to-host services they already have in place.

NDS on the Border

Under the deal with Microsystems, Novell will ship Border Services with a 45-day subscription to Microsystem's Cyber Patrol, a weekly updated Web content-tracking service. This integration will let administrators restrict end-user access to Web information based on content.

Border Services also lets administrators filter user Internet access by identifying other technical characteristics of Web sites, such as URLs, IP addresses or protocols. However, content filtering is simpler to set up and maintain, said IntranetWare Product Manager John Perkins.

After the 45-day license for Cyber Patrol expires, customers can contract with Microsystems to continue the subscription service. Pricing for the service was not available.

Web-to-host access

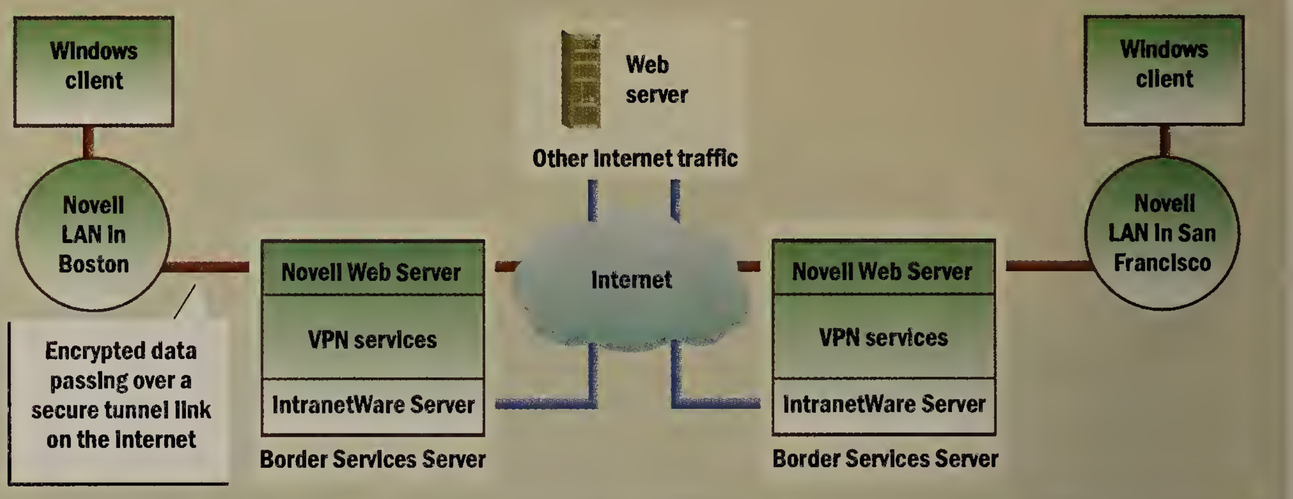
The IntranetWare HostPublisher is a stand-alone product that sits on an IntranetWare server running the Novell Web Server 3.0 and NetWare for SAA 2.2, Novell and IBM's host connectivity gateway. It acts as a bridge between the Web server and the gateway by translating 3270 mainframe datastreams into HTML pages. Therefore, an end user can view host data from an HTML Web page instead of using separate 3270 terminal emulation software.

When Novell first began publicly discussing the product, code-named Meta Connect 3270, the company had not planned to provide NDS integration in the initial release (*NW*, April 7, page 1). However, customers told Novell that NDS integration was a requirement, so the company delayed the beta a few weeks to add the directory integration, said David Holbrook, director of marketing for host connectivity at Novell.

Novell plans to ship IntranetWare HostPublisher by the end of the third quarter. Pricing was not available.

NOVELL BORDER SERVICES EXTENDS THE REACH OF INTRANETWARE LANS

Novell's Border Services Server includes virtual private networking (VPN) services that allow IntranetWare users to set up private, point-to-point communication between corporate LAN segments over the Internet.



WIRED WINDOWS

There is no free lunch

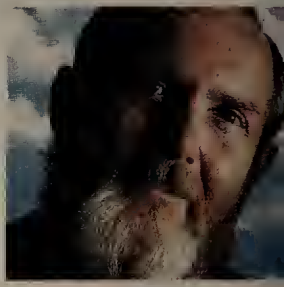
I recently touted Novell, Inc.'s Administrator for Windows NT (*NW*, April 7, page 22) as a great, robust directory system for an integrated NetWare and NT network. But there may be a better way.

Feedback from some users shows that there are shortcomings to Administrator that can make working with it in a large enterprise network somewhat tedious, even when it works correctly. Of course, Administrator does have two things going for it. First, Novell is offering it free for download until August at www.novell.com/intranetware/ntint/download.html. Second, the product comes from Novell, which knows Novell Directory Services (NDS) better than anyone.

However, a group of ex-Novell employees — including some involved in NDS development — launched a new company last year, NetVision, Inc., whose purpose is to develop applications for integrating other directory systems into NDS.

Their first product, Synchronicity for NT, has been received favorably (*NW*, Jan. 27, page 51). Because it uses Microsoft Corp.'s Active Directory Services Interface (ADSI), Synchronicity for NT is more tightly integrated with NT than Administrator. While Synchronicity costs more than Administrator — ranging from $4 to $14 per user depending on the number of licenses — it may have a better return on investment than the free product!

Tests conducted by NetVision showed that integrating 500 NT users into NDS took 14 minutes with Synchronicity and 75 minutes with Administrator. If you value your time at $50 per hour, which is low for a network administrator, Synchronicity saves you $55 on this one step. Also, because Administrator does not allow the simultaneous integration of users with multiple NT domains into NDS, this step might need to be repeated for every NT domain. However, this activity is all done simultaneously with Synchronicity, saving $50 per domain.


Dave Kearns

Administrator is also fairly picky about the NetWare platform on which it runs. It requires the latest versions of NetWare's Common Library calls, DS.NLM (the NDS engine) and Windows NT client. In contrast, Synchronicity works with a number of different versions of all three, ensuring better integration with other third-party products. This represents potentially huge savings because it guarantees that other server-based software won't break or need updates.

Further, WANs will show distinctly better performance with Synchronicity, and the performance difference grows as the number of NT objects grow. Synchronicity is event driven, meaning changes are only sent once — when they happen. Administrator requires NetWare's Service Advertising Protocol services and periodic polling of all servers, creating much more network traffic than Synchronicity.

NetVision's Web site (www.netvisn.com/) offers more information, comparison white papers and evaluation or beta versions of the products.

Kearns, a former network administrator, is a freelance writer and consultant based in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

There's a new mailing list for NT administrators that covers new NT bugs as they're discovered. NT BugTraq is a noncommercial venture. For details on the mailing list, or to subscribe, check the NT BugTraq Web site (http://ntbugtraq.rc.on.ca/).

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MAY 12, 1997

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Is It Ready For Prime Time?

INTERNET

5 Monitoring Tools

PC PREVIEW

What To Expect This Summer

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COVER STORY

8 *Desktop Videoconferencing: Is It Ready for Prime Time?*

If your agency is struggling with the question of whether to install the latest desktop videoconferencing equipment in your office, read our evaluation of the technology. While it might not be ready for mission-critical applications, DVC is ready for you to start experimenting with it.

INTERNET

18 *Monitoring Tools: Five Products That Track and Block Internet Traffic*

Many agencies are scrambling to adopt Internet usage policies. Our reviewer evaluated several software products that help systems administrators monitor and block Internet traffic. Read this story to figure out which tool is right for you.

SYSTEMS

22 *PC Preview: What to Expect This Summer*

As government users prepare for the summer buying season, they can look forward to some new and exciting PC technologies. We've taken an in-depth look at what's coming for your PC, including processors, modems, operating systems and add-in cards.

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FROM THE EDITOR

Why Service Is Important

I don't need to tell most government IT buyers that finding a vendor who offers good technical support is a critical part of a purchasing decision. It's not enough to choose a quality product at a low price. Agency buyers looking to spend the taxpayers' dollars wisely need to find a vendor who is going to support that product during its life cycle — five years or more in many government shops. That's why we put so much emphasis on customer service in our product comparisons.

The FCW Test Center evaluates two aspects of service: support policies and technical support. For support policies, we evaluate what support the vendor provides with the product. We consider the length of the warranty, whether on-site service is provided and for how long, and whether a money-back guarantee is offered. We also look at whether the vendor provides toll-free support and how: on the Internet, a toll-free telephone line, a bulletin board system or a fax-back service. We also consider the number of hours each day that the support line is open. For technical support, we place at least two anonymous telephone calls to the vendor's technical-support line. We measure how many rings it takes for our call to be answered, how long we're on hold and whether the technician answers our questions correctly.

We then award scores — poor, satisfactory, good, very good or excellent — based on our findings. Often, these two scores, when taken together, account for 15 percent or more of the points in a comparison. Service is usually ranked right up there with performance and price as three of the most heavily weighted categories. In fact, product comparisons have been won or lost based on the quality of the service that we received.

What are the trends in customer service? We see vendors becoming more competitive against one another in the support policies area, changing their terms in response to other vendors and contracting vehicles. For example, the five-year warranty offered on the Air Force's Desktop V contract has put pressure on PC manufacturers to extend their warranties in response.

In the area of technical support, many companies are beefing up the quality of the service they provide. Micron Electronics Inc., for example, recently launched a special tech-support line for federal customers and will soon launch another for state and local government customers. Other companies that already offer government support lines include Acer America Corp. and Zenith Data Systems Corp. These lines are usually faster and more responsive than regular commercial lines, which have a higher volume of calls.

However, we still experience some really horrible technical support. In one recent review, it took two days for a technician to return our call. In another case, a vendor tried to charge us $1,250 to answer a straightforward question that competing vendors answered for free.

This brings us to another point: When you buy a product, carefully consider which services are offered for free and which you must pay for. In a recent review, a product lost based on this very issue. One vendor offered free software but charged a high price for each technical-support call. A competing vendor charged for the software but offered free support for 90 days. In the end, we found the second vendor offered the better deal.

The FCW Test Center is the only government-oriented test center that evaluates the quality of services vendors provide. It takes a lot of time and patience to do that, but we believe support services are an important factor for buyers to consider.

What kind of service are you receiving? E-mail me your tales of joy or woe at cdm@fcw.com, and I'll write about them in an upcoming column.

— Carolyn Duffy Marsan

OFF THE SHELF

Lotus Offers Discounts On SmartSuite

For federal agencies considering their office suite options, Lotus Development Corp., Cambridge, Mass., recently announced a limited-time discount on SmartSuite 97 to sway buyers away from Microsoft Office.

The competitive upgrade is available through Lotus' Passport volume-pricing program. Microsoft Office users and current SmartSuite Passport customers can upgrade to SmartSuite 97 licenses with maintenance that would last the remainder of the fiscal year. Maintenance contracts entitle customers to free upgrades.

"This promotion offers government customers some very compelling reasons to upgrade to SmartSuite 97," said Michael Sheehan, director of Lotus' government sales and marketing division. "We believe we can significantly strengthen our position in the suite market by delivering customers better technology at a better price than the competition."

This offer, available for General Services Administration schedule customers until Sept. 30, lists SmartSuite 97 at $29.50 per license with a minimum of 25 licenses. In addition to the discounted pricing, Lotus also is including a free, interactive training program, PTS Learning Systems' On Demand Interactive Learning for Lotus SmartSuite 97. Customers outside North America will have access to Lotus' Desktop Training Centers.

For more information about the program, point your browser to **www2.lotus.com/smartsuite.nsf**.

— Dustee Anderson

GTSI Adds PictureTalk

PictureTalk Inc., a visual communications software company has signed Government Technology Services Inc., Chantilly, Va., as its exclusive federal government reseller.

Pleasanton, Calif.-based PictureTalk sells conferencing software that allows PC users to share information on their computer screens with other users either locally or over long distances in real time. With the company's Client-Server-Client software, users can participate in meetings regardless of their location, computer platform, applications being run or the speed of their network connection.

The product uses the World Wide Web to let users easily navigate to virtual meeting locations, according to company officials. It is a software-only solution that requires no special hardware.

PictureTalk's software is on GTSI's GSA Schedule E and NASA's Scientific and Engineering Workstation Procurement II contract. It is available for $8,446. GTSI can be contacted at (703) 502-2026.

For more information, contact PictureTalk at (510) 467-5300 or via the Web at **www.picturetalk.com**.

— Heather Harreld

Analyzing Security Risks

Norman Data Defense Systems Inc., Fairfax, Va., has released Norman Risk Analysis: The Buddy System for Windows, a fully automated risk analysis and management software solution that enables systems administrators to serve as their own security consultants. The tool automatically assesses the potential for system vulnerability and then adjusts and monitors vulnerability levels for applicable threats.

In addition to searching for vulnerabilities, the Buddy System automatically tests and evaluates security measures already in place and gauges compliance with those policies.

BEST-SELLING SOFTWARE

Mar.	Feb.	Product	Company
1	2	Windows NT Server	Microsoft
2	5	Windows NT Workstation	Microsoft
3	3	Exchange	Microsoft
4	4	Windows 95	Microsoft
5	7	Office	Microsoft
6	8	System Management Server	Microsoft
7	10	DOS	Microsoft
8	—	Access 97	Microsoft
9	—	Notes	Lotus
10	—	Windows 3.11	Microsoft

This list ranks the top 10 software products according to the total number of units sold in March 1997 on the General Services Administration's multiple-award schedule B/C, as compiled by Government Technology Services Inc., the largest GSA reseller.

The product has been configured to fit a variety of federal environments, including the Justice Department and the intelligence community. It produces more than 50 types of reports, including formal risk analyses of individual workstations or an entire network, hardware and software inventories, and locations reports and corrective actions.

The system is available on the GSA schedule and sells for $9,500. For more information, contact Norman at (703) 573-8802 or via the World Wide Web at **www.norman.com.**

— Heather Harreld

AI-Based Security

With the latest Internal Revenue Service scandal splashed across the news, the issue of tracking what employees are looking at on federal networks has been pushed to the forefront. New York-based Intrusion Detection Inc. recently announced Kane Security Monitor (KSM), a real-time network security monitor for Microsoft Corp.'s Windows NT that would automate this process of tracking possible security violations.

KSM uses IDI's Shadoware, an artificial-intelligence technology, to filter through security and audit data, creating digital signature fingerprints for each network user. The product, which can be installed on a workstation or server running Windows NT 3.51 or higher, collects log files in a database and monitors suspicious activity or variations in users' usage patterns. If a security breach occurs, either through outside hackers or internal authorized users, KSM will notify a designated security officer through e-mail, fax or pager.

Once KSM is installed on a central workstation or server, a systems administrator can choose which systems are to be monitored by sending out agents to sit on the various clients. The product is not obvious to the end user, nor does it affect network performance. But IDI recommends that firms tell employees the system is in place because it can work as a psychological deterrent, said Jim Walker, IDI's vice president of marketing.

The necessity of monitoring Windows NT networks is growing as the operating system becomes more prevalent at federal sites. However, Windows NT has no central collection facility for the audit files, and it would be time-consuming for a person to review all that data daily. Because Windows NT is already creating log files stored on each workstation, KSM can sift through that data and determine a pattern.

Walker said the IRS and the Air Force are beta testing KSM. IDI's security assessment product, Kane Security Analyst, is being used by the National Security Agency, the Army and the Air Force.

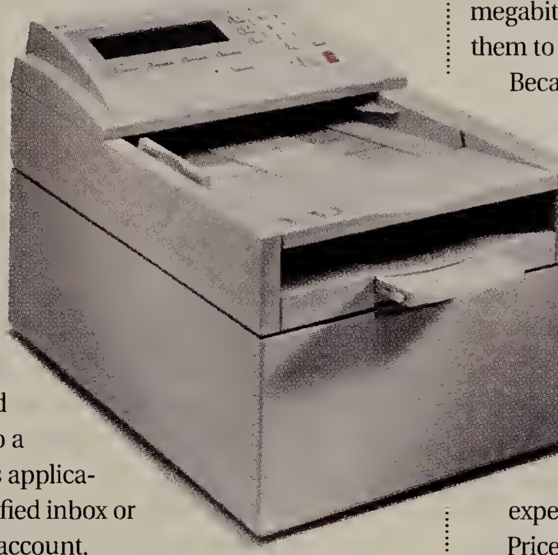
Pricing for KSM starts at $695 per server, and the company expects to add it to the GSA schedule in July. For more information, call (800) 408-6104 or visit **www.intrusion.com**.

— Dustee Anderson

Network Scanner

With the introduction of Hewlett-Packard Co.'s latest network scanner, the government's goal of a paperless office may be one step closer to reality. The HP Network ScanJet 5, which was introduced in March, lets users create, store and distribute electronic copies of documents throughout the enterprise.

HP designed the ScanJet 5 as an alternative to interoffice mail, fax machines and copiers, which all work with hard-copy documents. Instead, with the ScanJet 5, users can create electronic copies of paper documents and send them to multiple recipients on the network simultaneously. Each user can create up to 32 personal distribution lists, each of which can hold up to 512 addresses.



Scanned documents also can be forwarded to fax machines via local-area network fax solutions from either Castelle Inc. or Biscom Inc., or to a PCL5-compatible printer. On the receiving end, users can specify the application or directory in which they prefer to receive incoming documents.

Documents can be received from the ScanJet 5 and routed directly to a favorite business application or to a specified inbox or personal e-mail account.

The 50-page automatic document feeder (ADF) can shuffle up to 15 pages per minute into the ScanJet 5 for 300-dots-per-inch scanning. In addition, lifting the ADF reveals a standard flatbed scanner for scanning bound or single-page documents.

HP also bundles Caere Corp.'s OmniPage Limited Edition OCR (optical character recognition) software. Likewise, the system is compatible with Cardiff Software Inc.'s TELEform forms processing software.

The ScanJet 5 is available for $2,269 on the GSA schedule through Westwood Computer Co. To order, call (800) 800-8805.

For more information about the product, visit HP's Web site at **www.hp.com**.

— Daniel M. Verton

Expanding Army Networks

Users looking to get more bang out of their existing copper wires may want to consider Phoenix-based AG Communications Systems' ATIUM GateWay product line, an asymmetric digital subscriber line (ADSL) solution that is already installed at bases throughout the Army.

In a nutshell, ADSL allows telecommunications managers to get more bandwidth to users without the labor and expense involved in replacing existing copper wiring with fiber. Roger Heldt, senior manager for military programs at AGCS, said ATIUM GateWay delivers 2 megabits of data per second to Army users, allowing them to send about 130 kilobit/sec back to the network.

Because ADSL is far speedier than modem transmission or Integrated Services Digital Network technology, Army personnel have found it ideal for Internet and local-area network access, Heldt said.

Meanwhile, managers need not upgrade their Plain-Old Telephone Service or install fiber to use ADSL. "Fiber makes sense in high concentrations," Heldt acknowledged. "But there are several thousand buildings at Fort Bragg [Army base in North Carolina], so it is prohibitively expensive to run fiber everywhere."

Priced at about $2,000 per line, the ATIUM GateWay solution encompasses modems, hubs, switches and the ATIUM GateMaster, a module that manages account information and ensures privacy. The GateWay premise modem includes a built-in Ethernet hub to allow up to four users to connect simultaneously.

Although the Army has so far purchased only GateWay configurations integrated into existing AGCS GTD-5 switches, the company also offers a stand-alone version of GateWay compatible with standard central office switches offered by other companies. Army users can purchase either configuration through the Communications-Electronics Command's Long-Term Life Cycle Support contract held by Halifax Engineering Inc., Alexandria, Va. That contract was due to expire by the end of April, and bids have been submitted on a follow-on contract.

A spokesman for AGCS predicted that the rest of the world will soon follow the Army's lead in adopting ADSL. "The technology hasn't hit the mainstream yet, but the military is on the cutting edge," he said. AGCS can be reached at (888) 888-AGCS.

— Brad Bass

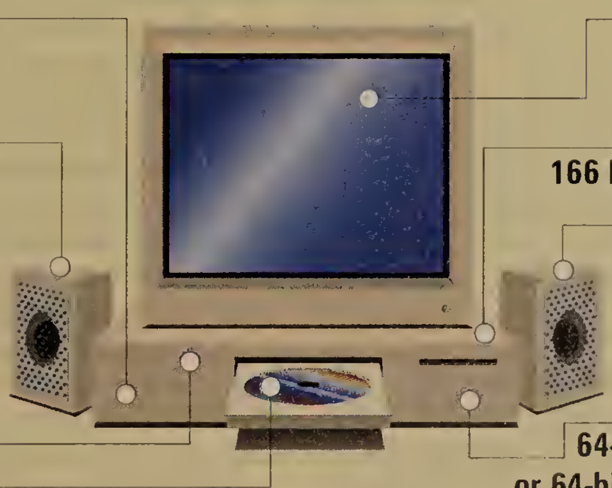
See **OFF THE SHELF,** *Page* **21**

FCW test center

HARDWARE HELP

$2,500

If you're going to buy a multimedia computer system, here's the minimum configuration we recommend:



HARD DRIVE
2.5G

SOUND
16-bit sound card

MEMORY
32M of RAM

CD-ROM
8X

MONITOR
17"

CPU
166 MHz MMX Pentium

SPEAKERS
External

VIDEO CARD
64-bit PCI (4M of VRAM)
or 64-bit 3-D graphics card

Sharp's EFS 3500

A Good Way to Manage Paper Documents

BY STUART MELNITSKY

Has the dream of a paperless office eluded your organization? Are your file cabinets bulging with forms deemed too important to toss in the wastebasket but too difficult to organize? Well, Sharp Electronic Corp.'s Electronic Filing System 3500 offers a solution worth considering.

With the EFS 3500, you can import paper-based forms — via scanner and fax machine — and set up indexed databases to organize documents for later retrieval and viewing. If you take advantage of the system's robust OCR capabilities, you can convert images to text — a particularly useful feature if you want to search for a text string in one or more documents.

Overall, I was impressed with the EFS 3500. I set up the system in less than 30 minutes. Once I attached the document feeder to the scanner and connected the SCSI cable to the PC, I was ready to go. The software came pre-loaded on the PC. I tested the EFS 3500 in a Novell NetWare 4.0 environment, but it is also compatible with Microsoft Corp.'s Windows NT, Windows for Workgroups, Banyan Systems Inc.'s VINES, IBM Corp.'s LAN Manager and Artisoft Inc.'s LANTastic.

REPORT CARD

B+

Electronic Filing System 3500

Sharp Electronics Corp.
(201) 529-8200
www.sharp-usa.com

Price and Availability

Sharp's GSA pricing for a stand-alone Pentium-based system starts at $15,296. The company offers less-expensive 486-based systems, more-expensive networked systems and discounts for volume buyers.

Remarks

Installation and configuration are straightforward, and the product offers a robust set of tools for creating, maintaining and querying databases. The 16-bit software modules — Database Administration, System Administration and Input/Retrieve — are a little rough around the edges and will benefit from an upgrade scheduled for later this year.

Final Score

Very Good

The EFS 3500's true power lies in the hardware. At the heart of the system is a Pentium-based PC with a 1.2G optical disk drive, which is responsible for maintaining the document repositories. You have your choice of monitor sizes, but if you opt for the 19-inch color, you'll likely need some help hoisting the 95-pound monitor onto your work area.

The EFS 3500 also includes a 40-pages-per-minute flat-bed color scanner and document feeder. Although 40 pages per minute represents a best-case scenario, I was not disappointed with the scanner's performance. During my testing, the scanner averaged about 33 pages per second for text-heavy documents with a moderate number of graphic elements.

If the EFS 3500 has a weak link, it's the software, which has three major software components: Database Administration, System Administration and Input/Retrieve (the client portion). Although they're quite functional and offer fairly easy-to-navigate interfaces, these 16-bit applications are a bit staid. For one thing, you can't have more than one module open at a time. You also must close one database before opening another. A Sharp representative indicated that a new 32-bit version of the software will be released later this year.

To get the most out of the EFS 3500, you'll need to spend some time familiarizing yourself with the Database Administration module. Your database structures — names, indexed fields, etc. — must be set up before you save documents. Fortunately, the EFS 3500 offers a fairly easy-to-grasp database structure. Three database levels are available: super groups, document groups and index fields.

Therefore, if you're setting up a database structure for your accounting department, you may decide to set up a super group called Accounting. Within that super group, you can set up document groups, such as Purchase Orders, Expense Forms, Accounts Receivable and Accounts Payable. Each document group will hold documents, or records, that can be identified by a unique identifier — the index field — such as a Social Security number or purchase order number. You can also set up full-text indexes for your documents, but you'll need to run the OCR option when you import your documents.

The Database Administration also includes useful maintenance and security options. You can decide which users can access the database and specify their privileges: View, Modify, Add or Delete. On the maintenance side, I liked the Pack/Rebuild utility, which recaptures disk space by reducing the size of a fragmented database.

The System Administration module allows you, or a designated administrator, to set up user accounts for the EFS 3500 client software. You must set up in-baskets — either public or private — for users before they can view documents and perform database operations. I found EFS 3500 system administration pretty straightforward. If you're a NetWare site, you can import user names from the bindery. The product does not support NetWare Directory Service, so you'll have to use bindery emulation mode if you want to take advantage of the import capability in a NetWare 4.x environment.

The Input/Retrieve module is the client software that allows appropriately privileged networked users to view and annotate documents in their in-baskets. Users then can delete documents or forward them to other users' in-baskets. Most likely, however, users will want to take advantage of the database capabilities.

You can index documents to specific document groups within a database structure. And if you need to look at some existing database records, you can either browse or query a database. Browsing gives you a list of all the documents in a database, but if you need to find a specific set of records, you'll want to set up some queries.

I found the database query tools to be pretty potent. You can search by indexed field, or, if you have converted documents to a text format, you can perform a full-text search to locate a record or set of records.

Overall, I liked the EFS 3500. Despite a few rough edges around the software and a hefty price, it should prove a boon for agencies looking to better manage their paper documents.◀

Melnitsky is a free-lance writer and consultant based in Brookline, Mass.

DiskAccess 3.0

NFS for 32-Bit Platforms

BY PAUL FERRILL

Moving files between a Unix workstation and a PC without the right set of tools can be frustrating. If you have a Transmission Control Protocol/Internet Protocol (TCP/IP) network connection between the two systems, you can use the File Transfer Protocol (FTP) but it is somewhat tedious. The best method is to access the Unix machine's Network File System using an NFS client on the PC.

In the world of 16-bit operating systems, one of the more popular NFS clients available was PC-NFS from Sun Microsystems Inc.. This product allowed you to access files on a Unix machine just like you could on a Microsoft Corp. Windows NT, Novell NetWare or other server. This product also made it possible to share printers on the Unix machine.

Now there's a new 32-bit client written specifically for Windows 95 and NT 4.0 that makes accessing NFS services as easy as a click in the Network Neighborhood. DiskAccess 3.0 from Intergraph Corp. provides an NFS client package that works seamlessly with the Windows 95 interface. DiskAccess also supports Object Linking and Embedding links to files on an NFS server. If you create a document with an OLE link to an NFS resource, it will automatically reconnect each time you open it.

I had no trouble installing DiskAccess 3.0 on a 100 MHz Pentium PC running NT 4.0 Workstation. The product comes on six floppy disks, so some disk swapping was required. Total time to have the product up and running was about 15 minutes. After installation, a DiskAccess icon appears in the Control Panel and provides access to a configuration dialog for various options including authentication, mount options and file access.

Once installed, DiskAccess makes itself known

APC's Smart-UPS 450

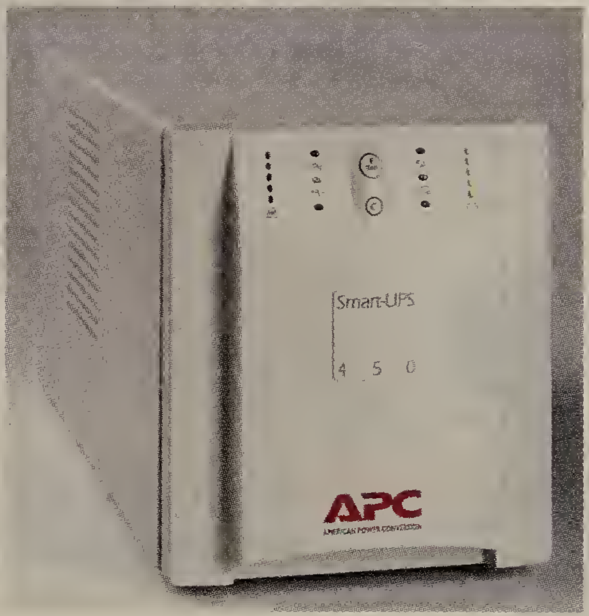
Peace of Mind During Electrical Outages

BY CHIP PETTIROSSI

Blackouts, brownouts and power surges can wreak havoc on any electrically powered system, especially computers. To prevent equipment failure and potential data loss, American Power Conversion offers its Smart-UPS 450 power protection system for departmental or enterprise servers, telecommunications equipment and other mission-critical hardware. We recently reviewed this system in our test center.

After unpacking the unit, we found a quality assurance report showing test results of the unit's internal temperature, self-test, output voltage, LEDs and load-power calibrations. Overall, the Smart-UPS 450 is very easy to set up. Although the unit is a bit heavy — 29 pounds — it sits on the floor nicely. After plugging the unit into an electrical outlet and turning the power switch on, the Smart-UPS 450 conducted a self-test before reaching on-line status. Our unit was up and running immediately after plugging it into an AC outlet. However, to get a maximum battery charge, the vendor recommends charging the battery for 2.5 hours before using the system.

According to the vendor's literature, users can remove the internal battery pack while the unit and loads are on. However, we became a little skittish when we saw the warning that the unit can be energized even when unplugged and that small sparks at the battery connectors are normal during battery connection. We were unable to easily remove the positive power lead.



Several LED indicators — on-line, load power, voltage boost, voltage reduction, battery charge, overload, battery on and replace battery — are on the front of the unit. These status lights are easy to read, even when the unit is on the floor. On the back of the UPS are four standard three-prong electrical outlets to attach equipment, a special screw to ground telephone lines or network lines, a quick reset overload switch, an LED brightness switch, a standard RS-232 serial port and an accessory option slot. In addition, a special LED is available to check the electrical outlet wiring. If the LED turns on, you have a problem with your electrical wiring.

Smart-UPS 450 ships with PowerChute plus software, which provides unattended system Shutdown capabilities. This power management and diagnostic software is compatible with a variety of operating systems, including Microsoft Corp. Windows 95/NT, LAN Server, IBM Corp. OS/2, Novell NetWare, Apple Macintosh, Sun Microsystems Inc. Solaris, IBM AIX and Hewlett-Packard Co. UX. In addition, PowerChute plus integrates with third-party server management applications from Compaq Computer Corp., IBM, Hewlett-Packard, Intel Corp. LANDesk Server Manager and Microsoft's SMS. PowerChute plus can safely shut down business applications such as SAP R/3, Lotus Development Corp. Notes, Netscape Communications Corp. Server and Microsoft's Back Office Suite.

We ran PowerChute plus 5.0 on our in-house Windows NT 4.0 Server. We found the software easy to install and helpful in configuring and diagnosing the UPS. To enable software to communicate with the Smart-UPS 450, the backup unit must be serially connected to your computer. During the setup procedure, the software automatically detected the Smart-UPS 450.

The most powerful feature of this software is its ability to automatically shutdown the attached server when AC power is interrupted. Multiple servers in different windows domains can be controlled from a single PowerChute station. However, according to APC, a limitation of Microsoft's NetBEUI protocol prevents UPS monitoring across routers. Users can eliminate this limitation with SNMP. PowerChute plus can be configured to notify network administrators via e-mail and/or pager based on predefined events such as maximum internal temperature exceeded, UPS running on battery and when communication with the UPS is down.

PowerChute plus has been integrated with the World Wide Web via two plug-in programs: WebAgent and WebAlert. WebAgent allows users to monitor and configure their UPS using a Web browser, while WebAlert sends warning messages to users via their Web browser before the UPS (running in battery mode) brings down the server.

APC sells numerous options for increased management capabilities and remote monitoring that can plug into the accessory slot on the Smart-UPS 450. Up to 100 hours of additional runtime is provided by plugging in optional battery packs.

The user's manual was useful and easy to read. It covered basic setup and operational procedures as well as suggested solutions to common problems. The company offers a two-year warranty policy on the Smart-UPS 450. In the event a UPS-connected system is damaged by an AC surge, including surges due to lightening, APC will repair or replace up to $25,000 of connected equipment. Technical support is provided via a toll-free number or on-line through Compuserve and the company's Web site. ◀

REPORT CARD

B+

Smart-UPS 450

American Power Conversion
(800) 877-4080
www.apcc.com

Price and Availability

GTSI sells the Smart-UPS 450 with the Parachute plus software for $272 on the General Services Administration contract GS-35F-4120D and for $269 on the Navy's Desktop BPA.

Remarks

Network administrators wanting to avoid potential data loss due to electrical outages or surges should seriously consider a UPS solution such as APC's Smart-UPS 450. The generous number of diagnostic LEDs and powerful system software make this solution a good choice.

Final Score

Very Good

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through the Windows Explorer and Network Neighborhood. The Map Network Drive option on the Tools menu in Windows Explorer lets you assign a drive letter on your local machine pointing to an NFS mount point. NFS mount points are analogous to a Windows share. Using the Network Neighborhood lets you access files on an NFS server as if they were a folder on a local drive.

You can also connect to NFS servers running on NetWare and Windows NT Server. For testing purposes, I connected to a Linux machine running native NFS and an NT 3.51 server running Intergraph's DiskServer NFS product. I had no problem browsing all available mount points. When browsing the NT 3.51 server, I ran into a protocol problem. Since I had not disabled the normal Microsoft SMB protocol, the NT Workstation machine was seeing the server with that protocol first, thereby confusing the DiskAccess browser. In all likelihood, you won't normally use NFS to connect one NT machine to another anyway.

On the technical side, DiskAccess runs as a kernel mode Device Driver Service and starts at system boot time. You'll never know it's there, and all the work gets done in the background without any further intervention. It also uses Microsoft's native TCP/IP protocol stack for the best performance and compatibility. Intergraph and Microsoft jointly developed the redirector technology, which should eliminate operating system conflict.

The documentation for DiskAccess is a little skimpy on page count but does contain all the information necessary to get the product up and running. Ample screen shots help guide you through the configuration screens. Intergraph also maintains a product support area on its Web site that includes a search function to help you trouble-shoot any problems you might have.

If you're looking for a way to seamlessly share files between a Unix server and PCs running either Windows 95 or NT 4.0, you'll want to give DiskAccess a good look. ◀

Ferrill, based at Eglin Air Force Base, Fla., is associate principal engineer at Sverdrup Technology.

REPORT CARD

B+

DiskAccess 3.0

Intergraph Corp.
(800) 747-2232
www.intergraph.com

Price and Availability

DiskAccess 3.0 is available for $160 on the Naval Facilities Engineering Command and Naval Air Systems Command CAD-2 contracts. It is also available on the GSA schedule.

Remarks

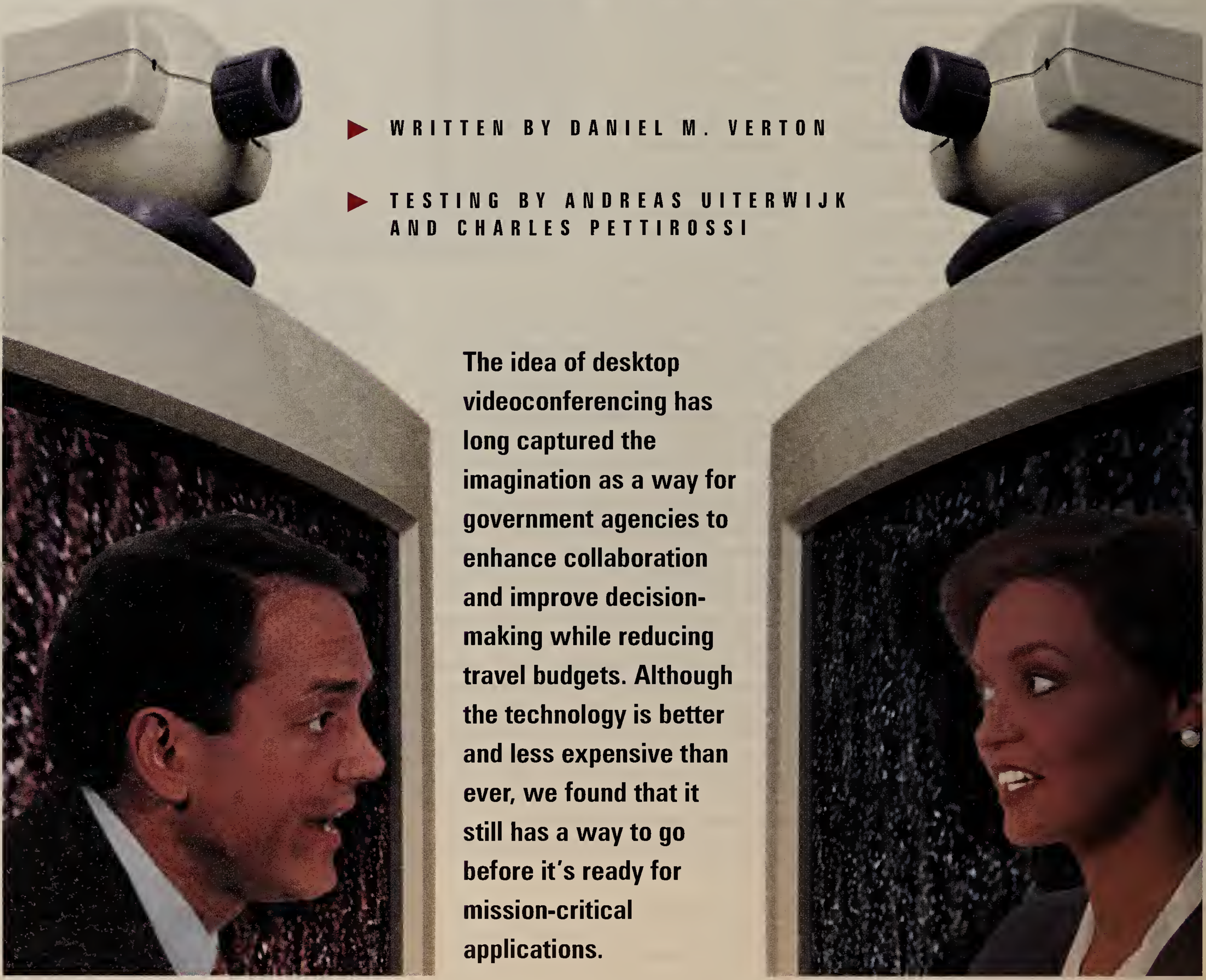
DiskAccess 3.0 provides seamless NFS integration into the Windows 95/NT 4.0 desktop. It also offers full support for NFS versions 2 and 3.

Final Score

Very Good

Desktop Videoconferencing

Is It Ready for Prime Time?



▶ WRITTEN BY DANIEL M. VERTON

▶ TESTING BY ANDREAS UITERWIJK AND CHARLES PETTIROSSI

The idea of desktop videoconferencing has long captured the imagination as a way for government agencies to enhance collaboration and improve decision-making while reducing travel budgets. Although the technology is better and less expensive than ever, we found that it still has a way to go before it's ready for mission-critical applications.

Videoconferencing technology has developed rapidly over the years and is now widely used in the government for applications ranging from the military monitoring operations in Bosnia to the Justice Department holding pre-trial hearings for accused criminals. But in most cases, agencies are using high-end videoconferencing systems housed in specially designed rooms.

Now less-expensive and high-quality desktop videoconferencing (DVC) solutions are hitting the market, and federal agencies need to decide how and when to adopt them. In our testing, we found the technology still has a few hurdles to overcome before it's ready to become as ubiquitous as the fax machine or telephone.

Why should government embrace DVC solutions? The simple answer is because the technology brings people together and should, therefore, enhance cooperation and improve productivity. Furthermore, these systems can allow agencies to eliminate some of the costs of planning and attending face-to-face meetings by hosting them over a network instead.

Among the potential uses of DVC in government are real-time mission planning and coordination, distance learning and training, and a wide array of health care applications, from remote surgical assistance to on-line discussions of X-rays and medical records. These applications are all made possible by the enhanced interpersonal communications as well as document and application sharing that most DVC solutions offer.

The four systems evaluated here — Intel Corp.'s

THE CONTENDERS

- **Intel Corp.'s ProShare Conferencing Video System 200**, available on the GSA schedule. Score: 6.50
- **PictureTel Corp.'s Live200p**, available on the GSA schedule. Score: 7.69
- **Sony Electronics Inc.'s TriniCom 500**, available on the open market (GSA pending). Score: 5.27
- **VTEL Corp.'s DVS 2000**, available on the Hanscom Air Force Base IMC VTC Contract. Score: 6.57

ProShare Conferencing Video System 200, PictureTel Corp.'s Live200p, Sony Electronics Inc.'s TriniCom 500 and VTEL Corp.'s DVS 2000 — are midrange, local-area network-based and Integrated Services Digital Network (ISDN) desktop packages.

For LAN-based solutions, it is important to note the pros and cons of employing a multipoint conferencing solution (see Diagram 1, Page 12). Of the systems reviewed here, only Intel's ProShare package is capable of multipoint LAN conferencing without the use of a separate dial-out ISDN connection. While ISDN easily scales to support multipoint DVC, multipoint support over the LAN should become more widely available later this year.

Our choice for the best desktop videoconferencing solution was PictureTel's Live200p, which posted a final score of 7.69 on our scale of 1 to 10. PictureTel's offering had the best performance by far in all categories, including application sharing, videoconferencing, file transfers and whiteboarding. In second place was the VTEL system, which had a score of 6.57 and performed solidly across the board but tied for the highest price with the Sony system. In third place was Intel's ProShare, which received a final score of 6.50 based largely on its low price and intuitive software. However, we found the system's application-sharing and file-transfer functions to be poor and its whiteboarding only satisfactory. Sony came in last place because we were unable to get its application-sharing feature to work, and its technical support was poor.

AT A GLANCE

Videoconferencing

Pricing

Ranges from $2,100 to 4,000, based on two-unit purchases.

What's Selling

The government is required to buy standards-based products (i.e., International Telecommunications Union). Although LAN-based systems are still in their infancy, solutions that offer support for ISDN running at 384 kilobit/sec will be the most common.

Where to Find Bargains

The GSA schedule.

What to Specify

Audio and video quality are most important, but also look for systems that are rich in features and easy to use. Application sharing and whiteboarding are also important.

Live200p

PictureTel's Live200p was designed as a complete DVC add-on for systems running Microsoft Corp.'s Windows 95. The company also has plans for a Windows NT 4.0 version. We evaluated Version 1.1 of the software, which provides an ISDN solution for videoconferencing and data conferencing only over the LAN. Version 1.5, however, scheduled for release in May, will offer an option to replace the ISDN module for LAN-based videoconferencing.

The Live200p PCI video board provides an RJ-45 jack for ISDN, an 8-pin DIN connector for the camera hookup, microphone and earpiece sockets, and a DIN connector for optional audio devices. If you're new to installing desktop video components, take your time with this system and be sure to affix the adhesive labels for the board's connectors. Needless to say, it would have been easier if the labels were already placed in the appropriate spots.

We opted to use the microphone and multimedia speakers for testing because the microphone headset that was provided was a little too short to fit comfortably around our heads. Although the microphone comes with its own stand, it also can be mounted on top of the monitor and is easily adjustable. The color camera is slightly larger than the others we looked at and can adjust only vertically.

The Live200p solution includes LiveWare data collaboration software, which provides application sharing, whiteboarding, file transfers, messaging and a shared clipboard. It also offers remote desktop control for accessing a remote system over an ISDN line. Overall, LiveWare is one of the easiest software packages to use and offers some excellent features, including its methods for adding and calling users. Toolbar icons and an address book hotlist save the user valuable time. Creating user profiles, however, is slightly less dynamic than with some of the other packages because no shared address list or business card functionality is offered.

LiveWare's file-transfer and application-sharing features and functionality are outstanding. We particularly liked the ability to view the status of files in either transfer or receive mode and the fact that the video windows are automatically resized and repositioned when starting the application-sharing function. To share an application, both users must click on the program they want

NOTES FROM THE TEST CENTER

FCW test center

ATM Solution Proves Robust

ANDREAS UITERWIJK AND CHARLES PETTIROSSI

Government agencies looking for a desktop videoconferencing (DVC) solution that is robust enough for mission-critical applications should consider the Bay Networks Inc. Multimedia Workgroup Solution. Running over an Asynchronous Transfer Mode (ATM) switch that provides 25M to the desktop, the Bay solution offers much better performance than the other systems we tested. But it comes at a premium price — as much as two to three times more than the other solutions.

The Bay solution has several components:

- A 25M ATM switch from Bay that comes standard with eight ports and can be expanded to 20 ports. The switch has two 155M ATM connections for hooking directly into an ATM backbone and an on-board Ethernet connection for plugging into an existing network.
- ATM multimedia network interface cards from Bay. These connect clients to the switch using standard Category 3 or 5 cabling and feature their own reduced instruction-set computer-based processor and memory. The cards have a Multivendor Interface Protocol (MVIP) connector for moving data directly to the H.320-compliant video codec card. All the video processing is done on the ATM and video codec cards, which are connected by the MVIP port and bypass the system bus and host CPU.
- PictureTel Corp.'s video codec card. PictureTel provided the camera, speaker phone and teleconferencing software.
- Multimedia operating system software from First Virtual Corp. that allows users to seamlessly run multimedia technology without interfering with the desktop or network operating system. FVC also provided a video cache server, which is a RAID 5-compliant storage unit for storing multimedia files and videos.

We set up a two-user DVC system on Compaq Computer Corp. Presario PCs sent by Bay along with the rest of the equipment. The setup for this system isn't easy, and it takes more time than with the other videoconferencing solutions we examined. An abundance of cards — as well as internal and external cables — are required. For an existing desktop, you'll need at least three free expansion slots. For an additional fee, Bay will set up the system and configure the client workstations.

Once installed, we found the Bay/FVC solution easy to use. To establish a call, all we had to do was open the phone book and select the user by name. Once the call was established, we could transfer files and share applications without any degradation of video quality. Application sharing is available through software from PictureTel (see review, above). Full whiteboarding is also provided. The overall performance was far superior to that of the other products, deserving an excellent rating in all four categories.

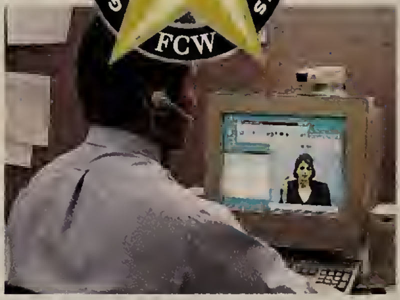
One feature the Bay/FVC solution is missing is picture-in-picture screens, which let you look at a picture of yourself and the other caller without having to look at two separate video screens. Another feature that is missing is multipoint conferencing for local-area network use, but Bay hopes to release a product soon to tackle this issue. For now, users need to dial out to a third-party service. Finally, the software caused a few general protection fault errors in Windows. However, new software was being introduced at press time that may solve this issue.

The other major downside of this solution is the price. An eight-user switch with Ethernet and Token Ring adapters runs $6,421 on the General Services Administration schedule, and each ATM multimedia card costs $765.

You'll also need user licenses for the software, which run $245 for a single-user license and $1,956 for a 10-user license, as well as a PictureTel video codec card, which costs $2,495 on the GSA schedule and includes a camera, microphone headset and teleconferencing software. Altogether, that brings the costs to $3,542 per user in an eight-user configuration — about 3.25 times higher than Intel's ProShare solution.

The big advantage of Bay's approach is that it eliminates jerky and jumbled images and unsynchronized sound. ATM services eliminate the bandwidth problems associated with other DVC systems. And Bay's approach integrates seamlessly with existing LANs. Bay and FVC provide a solution that meets the needs of today's most demanding DVC users. If money is not a big concern for your agency, take a close look at this solution.

Video-conferencing Products Compared



Products receive ratings from excellent to unacceptable in certain categories. Scores are derived by multiplying the weighting of each criterion by its rating, where:

★★★★★ = Excellent = 1.0 Outstanding in all areas
★★★★ = Very Good = 0.8 Meets all essential criteria and offers significant advantages
★★★ = Good = 0.6 Meets essential criteria and includes some special features
★★ = Satisfactory = 0.4 Meets essential criteria
★ = Poor = 0.2 Falls short in essential areas
● = Unacceptable = 0.0 Fails to meet minimum standards or lacks a feature

Scores are summed, divided by 100 and rounded down to two decimal places to yield the final score out of a maximum score of 10.0 (plus bonus). Products rated within 0.2 points of one another differ little.

	WEIGHTING	**ProShare Conferencing Video System 200**	**Live200p**	**TriniCom 500**	**DVS 2000**
Company		Intel Corp. (800) 538-3373 www.intel.com	PictureTel Corp. (800) 716-6000 www.pictel.com	Sony Electronics Inc. (800) 472-SONY www.sel.sony.com/SEL/	VTEL Corp. (800) 299-VTEL www.vtel.com
Basic DVC Performance	50	★★★ 30.00 Audio and video synchronization were very good. However, running full-screen is not possible without support for direct draw.	★★★★ 40.00 Sudden movement causes jumbled images, but they clear up quickly. Sound remained synchronized with a moderate amount of movement.	★★★ 30.00 Synchronization remained as long as movement was moderate.	★★★ 30.00 Crisp video images at all times. Audio/video synchronization was very good with minimal background movement.
Application Sharing	75	★ 15.00 Application sharing robs performance to pay for bandwidth and CPU power being used by the shared application.	★★★★ 60.00 Good synchronization of audio and video with normal amounts of movement.	● 0.00 System crashed each time we tried to run this feature.	★★ 30.00 Audio/video synchronization suffers during application sharing. Audio, however, remains real-time.
File Transfer	50	★ 10.00 There are no user-definable options for this feature, and it literally brings video performance to a stand-still.	★★★★ 40.00 No loss of synchronization at all. Video stream remains smooth, but images can get a little jumbled.	★★★ 30.00 Sharpness and clarity are good, but video can become jerky as additional motion is detected.	★★★ 30.00 User can set video and file transfer rates for each session. Some jerkiness noticed during file transfer.
Whiteboard	50	★★ 20.00 Increased use caused video to become choppy. Otherwise, performance remained satisfactory.	★★★★ 40.00 No problems. Audio and video synchronization remain stable.	★★★ 30.00 Video stream remains smooth and easy on the eyes until a lot of background motion is detected.	★★★ 30.00 Images remain clear, with very little loss of synchronization.
Setup	125	★★★ 75.00 Windows 95 wizards make for easy installation. However, when we ran the LAN-based option, we found that Intel's Conference Manager software does not support Windows 95.	★★★ 75.00 Very easy to install, with good instructions provided in documentation. Jacks require stick-on label for identification.	★★★ 75.00 Clear labeling and color-coded RCA ports eliminated the guesswork and made installation very easy. The ISDN setup was handled through the standard Windows setup wizard.	★★★ 75.00 Our test package came with a PC with bundled software and boards pre-installed. Configuration was simple and intuitive, requiring minor use of reference documentation.
Ease of Use	125	★★★ 75.00 Good help screens are provided that detail the available screen options and settings. Novice users should find the liberal usage of toolbar icons very helpful.	★★★★ 100.00 There is no shared address list or business card functionality, but the software has good graphical icon support. The whiteboarding utility was the best of the field.	★★ 50.00 Software is very similar to the solution from VTEL. Users will find the adding names and calling features very straightforward.	★★★ 75.00 Adding phone numbers and contact information is easy. However, we found it slightly difficult to determine which participant had control over shared applications.
Features	125	★★★ 75.00 Comes with ISA, ISDN and video boards. Camera rotation was limited, but we were able to pan via software. Product included a special wizard for creating business cards. It comes with a built-in answering machine.	★★★ 75.00 Single-board solution. Microphone headset was too small to wear comfortably. Software has a unique message and shared clipboard feature as well as a hotlist to access frequently called numbers. Instant preview of video setting changes is helpful.	★★★ 75.00 Supports Ethernet or Token Ring networks. Camera is mounted in telescopic base unit that provides for good angle adjustment. System also includes a standard telephone handset and cradle. Supports full-screen video sizing.	★★★★ 100.00 Single-board solution. The excellent camera design provides the best angle adjustments. It included picture-in-picture support. Available with three audio devices: headset, handset or speakerphone.
Compatibility	75	★★★★★ 75.00 Windows 3.x, Windows 95, H.320, H.324, H.261, H.224, T.120, G.711, G.728, FCIF, QCIF.	★★★★★ 75.00 Windows 95, Windows NT 4.0, H.320, H.324, H.261, H.243, T.120, G.711, G.722, G.728, CIF, QCIF.	★★★★★ 75.00 Windows 3.x, Windows 95, H.320, H.324, H.261, H.243, H.224, T.120, G.711, G.722, G.728, CIF, QCIF.	★★★★★ 75.00 Windows 3.x, Windows 95, H.320, H.324, H.261, H.243, H.224, T.120, G.711, G.722, G.728, CIF, QCIF.
Documentation	50	★★★★ 40.00 Very good quick-start guide came with the system. Overall, we were very impressed with the documentation's professional quality and useful content.	★★★★★ 50.00 A very well-done quick-start guide accompanied this unit. It included an excellent glossary of terms and a very good trouble-shooting section. Best set of documents we came across.	★★★★ 40.00 System comes with a well-done set of manuals that are easy to read and provide good-quality illustrations.	★★★ 30.00 Although there's no quick-start guide bundled with system, the documentation is good. Very good glossary of terms is provided as well as a good trouble-shooting section.
Technical Support	50	★★★★ 40.00 Analysts were very knowledgeable and helpful, but administrative procedures to get to a technician were a little too time-consuming.	★★★★ 40.00 Minimal hold time and knowledgeable assistance. Our questions were answered thoroughly and accurately.	★ 10.00 It took Sony three days to return our trouble call. Sony is in the process of building a technical team to support this product.	★★★★ 40.00 Hold times were minimal. Technical representatives were able to answer our questions immediately.
Support Policies	75	★★★ 45.00	★★★ 45.00	★★ 30.00	★★★★ 60.00
Warranty		1 year	3 years; fee-based	90 days	1 year
On-Site Service		1 year; fee-based	Yes; fee-based	Fee-based option is in planning stage	Up to 3 years; fee-based
Money-Back Guarantee		No	No	No	No
Fax-Back Support		Yes	Yes	Yes	Yes
Toll-Free Line		Yes	Yes	Yes	Yes
Other Support		Internet	Internet	Internet	Internet
Support Hours		7 a.m. — 5 p.m., M-F (PST)	8:30 a.m. — 8 p.m., M-F (EST)	8 a.m. — 8 p.m., M-F (EST)	5 a.m. — 5 p.m., M-F (PST)
Price	150	$2,180 (2 units) 150.00	$2,536 (2 units, fixed-focus camera) 128.94	$3,990 (list price, 2 units) 81.95	$3,990 (2 units) 81.95
Reseller		Entex	Wang INET Inc.	Sony	Frebon International Corp.
GSA No.		GS-35F-3114D	GS-35F-4131D	Pending	Hanscom AFB IMC VTC Contract
Phone		(800) 597-4472	(800) 758-4638	(800) 686-7669	(703) 848-8200
Final Score	1000	**6.50**	**7.69**	**5.27**	**6.57**
Remarks		**This system is not your best choice if your primary requirements are application sharing and file transfers. However, a low price and the brand name make it an attractive package for regular videoconferencing.**	**We were very impressed with the Live200p's performance and video quality. It also was one of the easier systems to use and came with excellent supporting documentation. A very good solution for the price.**	**Not one of the easier systems to use. Sony's technical support also leaves much to be desired. However, performance was good during basic videoconferencing, file transfer and whiteboarding.**	**The system from VTEL has a solid feature list, and it performed slightly better during application sharing than the Intel and Sony products. A good all-around system.**

to use. However, a small tab in the upper right corner indicates which user currently controls the cursor.

The whiteboarding utility of LiveWare is one of the most feature-rich applications we reviewed. It is launched from the main toolbar and automatically invokes an information window listing the names of those participating in the session. The drawing tools that are provided are quite extensive and are all displayed in graphical format.

PictureTel received scores of very good across the board during the performance evaluations. During basic videoconferencing, sound remains synchronized with the video as long as background movement is kept at reasonable levels. Although the video can become blurry or jumbled during fast movements, it generally clears up quickly. Sound and video also remain well-synchronized and of good quality during application sharing, file transfers and whiteboarding sessions.

Picture Tel's solution provides the best overall quality and is just ahead of the pack in terms of ease of use. Priced at $2,536 on the General Services Administration schedule for a two-seat configuration, the Live200p is a good choice to spearhead your agency's initial foray into desktop videoconferencing.

DVS 2000

On May 10, the DVS 2000 system officially became a product of VTEL Corp. as the merger of Compression Labs Inc. and VTEL Corp. went into effect. The DVC solution we tested, originally from Compression Labs, is sold as either an add-on kit or as a bundled, factory pre-installed system. Although we received the factory-installed solution for testing, which included a 133 MHz Pentium computer with 32M of RAM, a 1.2G hard drive, an 8X CD-ROM drive and a 33.3 kilobit/sec data/fax modem, we used the add-on kit configuration for pricing.

The DVS 2000 videoconferencing solution requires a single PCI slot for the conferencing board and one for a LAN adapter. The videoconferencing board comes with an integrated ISDN Basic Rate Interface (BRI) port, an audio adapter plug and a camera connector. With the use of a multivendor interface protocol (MVIP), the DVS 2000 board can handle data rates up to 384 kilobit/sec by combining three 128 kilobit/sec ISDN channels with a technique called Bonding (bandwidth on demand).

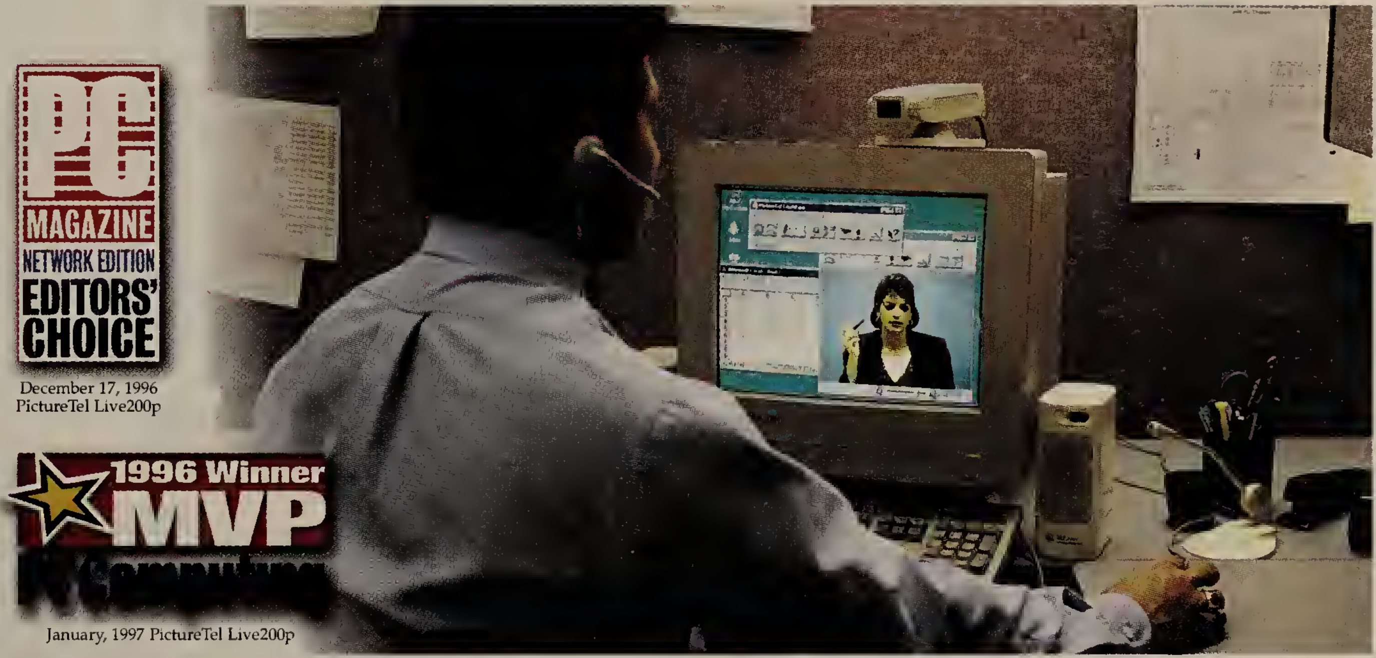
A spherical video camera rests on top of the system monitor in a rubber casing and adjusts very easily for different viewing angles. The camera is equipped with a manual focus knob as well as a helpful green LED indicating that the camera is operational.

In terms of features, the VTEL solution finished out in front. Some of the more useful features of the DVS 2000 were a headset with an integrated microphone and a separate, ergonomic speaker phone with options for mute and noise cancellation. The DVS 2000 also supports dual video inputs for NTSC/PAL and a third input for digital.

Although our test unit came pre-configured with the conferencing software installed, we had to re-install it to configure the system for LAN-based conferencing. In addition, we had to obtain new licenses from the vendor to enable the LAN feature of the software. Setup initially configures the system for ISDN and then walks you through the LAN option. Once completed, the installation utility automatically opens the software release notes, which provide helpful service numbers and information.

As with the rest of the field, the DVS 2000 lets you add users and user profiles to a local address list for speedy selection and dialing.

PLUG IT IN.
TURN IT ON.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MVP
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IN THE NEWS

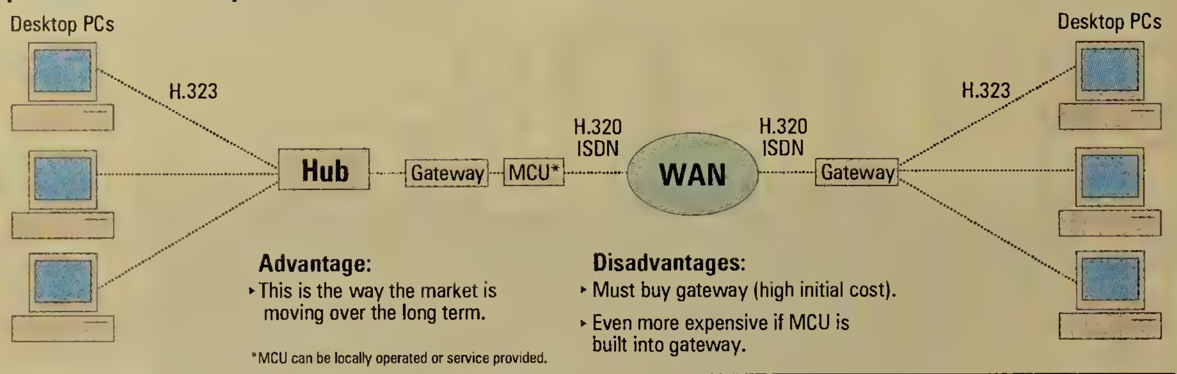
Employing Desktop Videoconferencing

The diagrams below depict two emerging alternative methods for employing desktop videoconferencing and their related advantages and disadvantages. Although the first approach carries with it greater initial costs, it is the direction in which the industry as a whole is moving. In this scenario, the multipoint control unit (MCU) can be provided by a separate service provider or the user can purchase it and install it locally. In addition, purchasing a gateway with integrated MCU will cost even more.

Approach 2, on the other hand, uses a router-based solution that eliminates the up-front costs associated with purchasing additional hardware. However, agencies will be forced to incur the added expense of installing a gateway for H.320 (ISDN) connectivity. More importantly, government users will have to wait for such a packet-based routing solution to be adopted and ratified by the ITU before it becomes a readily available option.

Because LAN to ISDN gateways are not currently available, we tested the DVC systems running ISDN to the desktop.

Approach 1: Gateway

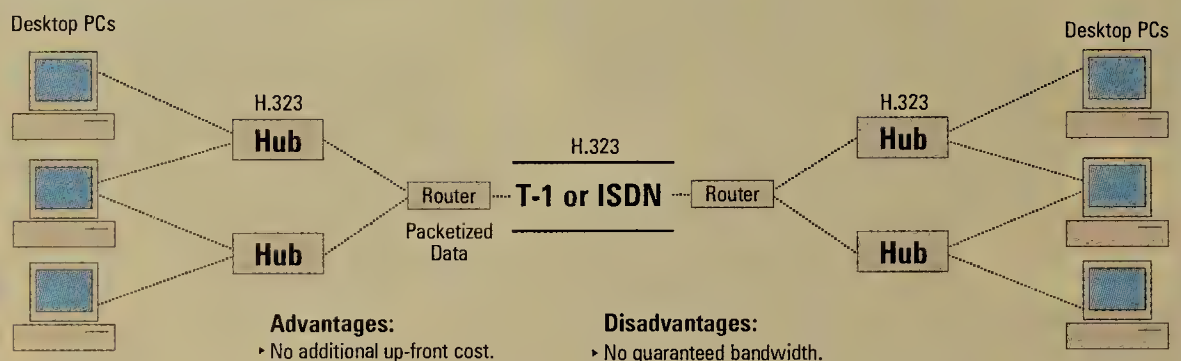


Advantage:
- This is the way the market is moving over the long term.

Disadvantages:
- Must buy gateway (high initial cost).
- Even more expensive if MCU is built into gateway.

*MCU can be locally operated or service provided.

Approach 2: Router



Advantages:
- No additional up-front cost.
- Theoretically uses existing equipment.

Disadvantages:
- No guaranteed bandwidth.
- ITU has yet to adopt packet-based standard.
- H.320 connectivity will require gateway.

Once a conferencing call has been established, the DVS 2000 software provides file-transfer, application-sharing and whiteboarding functionality.

We thought the file-transfer feature provided by DataBeam Corp.'s FarSite utility worked very well. It is a straightforward process that lets users send files in compressed or native format.

We also liked the application-sharing functionality of the system. As with file transfer, application sharing will require you to run FarSite. However, we found it a little difficult to determine which user had control at any given time. A text-based label or message would have made it easier to know when a remote user was working on the shared document. The software's whiteboarding capability was very general and was based around the use of the mouse instead of a more functional pen-and-board system.

As far as the overall performance of the system, sound synchronization was very good as long as there was minimal background movement. Although the video image was crisp and clear at all times, the video stream was best when movement was at a minimum. During application sharing, the audio remains real-time. However, it does not sync up very well with the video and is even worse when video images come through at much lower frame rates.

The system also provided very competitive performance results, with good scores for videoconferencing, file transfers and whiteboarding. However, its application-sharing feature, which was only satisfactory, could benefit from better synchronization of audio and video.

A two-seat configuration, including the conferencing board and software, is available on the Hanscom Air Force Base IMC VTC contract from Frebon International Corp. for $3,990.

ProShare Conferencing Video System 200

Intel's ProShare Conferencing Video System 200 features everything you'll need to conference, including software, a 16-bit video input capture board, an ISDN/audio board, a mountable color camera and an audio headset for hands-free control. It also is the only system capable of multipoint LAN conferencing without the need to dial out over a phone line.

Installation and setup of the hardware is very easy and can be accomplished by anybody with a moderate amount of PC hardware knowledge. We simply plugged the ISDN and video capture boards into two free ISA slots in our 100 MHz Pentium system, connected the headset to the appropriate input jack and plugged the color camera into the video board. We also installed a 3Com Corp. 10/100 PCI Ethernet card for LAN connectivity (not included in the price) and were required to use an NT-1 terminator for our ISDN connection. With those minor tasks accomplished, we were ready to load and configure our software.

Standard Windows 95 installation wizards make installing and setting up the ProShare software a breeze. Selecting the typical installation options should be fine for most users, although a custom option is available. For the ISDN protocol and switch options, we selected the default location values for the United States. Next, just enter your ISDN phone numbers and corresponding SPID numbers. You also can plug in a sub-address if you plan to run more than one conferencing node off of a single NT-1 terminator. This is like adding a second phone extension to your office phone line.

However, we ran into a few minor complications when setting up ProShare on the LAN. We had to set up a dedicated PC running Windows for Workgroups 3.11 and Intel's LANDesk Personal Conferencing Manager software, which currently does not support Windows 95. Then we found incompatibilities associated with a few Transmission Control Protocol/Internet Protocol stacks, such as SunSoft Inc.'s PC-NFS-Pro. In order to get around these problems, we downloaded Microsoft's TCP/IP stack for Windows for Workgroups from Microsoft's Web site. To complete the LAN setup, we added the IP address of the LANDesk Personal Conferencing Manager to a .INI file found on each PC running the ProShare conferencing software. Although this was a little annoying, the procedure was well-documented.

The conferencing software for Intel's ProShare was one of the better packages we reviewed. It received solid scores in the areas of adding and calling users, creating user profiles and application sharing. We particularly liked the file-transfer functionality of the Intel software. However, it was the only package not capable of providing full-screen video standard.

The software's liberal use of toolbar icons made creating an address list very simple. In addition, clicking on a clearly marked call button will automatically establish a conferencing session. Furthermore, a sound file on the local PC automatically reproduces the sound of a ringing phone to alert users to incoming conference calls. User profiles are created in the form of business cards that are displayed by the LANDesk Personal Conferencing Manager and can include a video image of the card holder.

We found the file-transfer functionality of the ProShare software to be top-notch. In addition to being able to select your directories and files to transfer, users can select participant names to receive the files from a predetermined list. One of the more helpful features is a progress meter that shows graphically the status of file transfers.

For application sharing, ProShare is very intuitive. The "share" portion of application sharing is embedded in the program so that the remote user does not have to worry about running the particular application. We also liked the ability to lock or unlock the turn-taking feature, which made it clear who was working on the shared document or application and when. Finally, a very useful warning message appears if at any time the video window blocks the application window. This feature would have been very useful in some of the other systems.

The whiteboarding functionality of ProShare is enabled through notebook sharing. The basic drawing tools that are provided are complemented by the addition of several icons to control sharing and turn-taking or synchronizing views. Overall, we thought this feature was very useful.

The performance results for the Intel system were mixed. During straight videoconferencing, video stream and sound synchronization were very good. The results were quite different, however, during application sharing and file transfers, which were rated poor. When sharing applications, the video literally froze as all available bandwidth and CPU power was consumed by the

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Sample GSA Configurations

Professional Systems

P5-133

- Intel® 133MHz Pentium® Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Vivitron®500 (13.9" viewable) Monitor
- 2MB SGRAM
- 1GB EIDE Hard Drive
- 3.5" Diskette Drive
- 12X CD-ROM Drive
- 7-Bay Mini Tower Case
- 104+ Keyboard
- Microsoft® Mouse 2.0
- MS® Windows® 95
- MS Office 97, Small Business Edition plus Bookshelf® 96
- 3-year limited warranty**

$1594

P5-166

- Intel 166MHz Pentium Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Vivitron700 (15.9" viewable) Monitor
- 2MB SGRAM
- 2GB EIDE Hard Drive
- 3.5" Diskette Drive
- 12X CD-ROM Drive
- 7-Bay Mini Tower Case
- 104+ Keyboard
- Microsoft Mouse 2.0
- MS Windows 95
- MS Office 97, Small Business Edition plus Bookshelf 96
- 3-year limited warranty**

$1976

G6-200

- Intel 200MHz Pentium® Pro Processor
- 32MB EDO DRAM
- Vivitron700 (15.9" viewable) Monitor
- 4MB SGRAM
- 2GB SCSI Hard Drive w/Controller
- 3.5" Diskette Drive
- 12X SCSI CD-ROM Drive
- 10/100 Fast Ethernet Network Card
- 12-Bay Tower Case
- 104+ Keyboard
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intel inside pentium PROCESSOR

application being shared. In addition, file transfers bring performance to a standstill, and no user-definable options are available to control the performance of this feature. During testing of the whiteboard feature, performance remained satisfactory, but video became choppy as use increased.

A two-seat configuration is priced at $2,180 and makes the Intel system very attractive to budget-minded buyers. However, it is not your best choice if your primary requirements are for application sharing and file transfers. For basic videoconferencing, however, the ProShare system will fare well and is relatively easy to set up and use.

TriniCom 500

A higher price and poor scores in technical support and application sharing bumped the Sony system into last place with a final score of 5.27.

Installing the TriniCom 500 should be a breeze even for novice users because the interfaces on the conferencing board and the audio adapter are clearly labeled. The documentation is also very easy to follow and provides helpful diagrams that eliminate much of the guesswork. Simply plug the conferencing board into a PCI slot in your computer, connect the camera using the color-coded ports, attach your ISDN cable and NT-1 terminator, and you're ready to configure the software.

NOTES FROM THE TEST CENTER

Videoconferencing Standards Explained

▶ DANIEL M. VERTON

If you're a government agency IT buyer looking to buy a videoconferencing solution for your agency or workgroup, it is absolutely necessary to understand the basics of standards-based videoconferencing to ensure that you select a system that will meet your requirements now and in the future.

The standards that govern videoconferencing were established by the International Telecommunications Union (ITU), which falls under the purview of the United Nations. These standards were put in place essentially for one reason: to ensure a seamless environment in which system interoperability is transparent to the end user. Therefore, "standards-based" systems should, for all practical purposes, be plug-and-play. But be warned: Not all videoconferencing systems are the same.

Today's videoconferencing systems can be broken down into three categories:

1. Those that meet the minimum requirements set forth by the ITU (i.e., are H.320-compliant).

2. Those that incorporate one or more optional features (i.e., support for higher frame rates).

3. Those that incorporate all available optional features on top of the minimum requirements.

Problems arise when systems of differing capabilities attempt to establish a conferencing session. To be successful, a common denominator must be found between the two systems. More importantly, this common denominator is always based on the performance parameters of the less-capable system. This is an important point that argues well for standardizing the acquisition of videoconferencing systems across the enterprise.

The primary video, audio and graphics communications standards are H.320 for videoconferencing over Integrated Services Digital Network (ISDN), H.323 for LAN conferencing, H.324 for Plain Old Telephone System (POTS) conferencing and G.728 for 16 kilobit/sec narrowband audio. However, because videoconferencing involves more than just pictures and sound, the T.120 standard was developed for data conferencing (i.e., exchanging files and images). H.320 acknowledges the existence of T.120 by providing a channel for data conferencing and exchange during the videoconference session.

Just as important as the standards that govern how videoconferencing systems communicate, however, are the transport media over which the information or data travels. Today agencies can run videoconferencing systems over ISDN connections, POTS connections or local-/wide-area networks (LANs/WANs). However, each of these media provide varying levels of bandwidth and differ in terms of their availability.

For enterprisewide remote videoconferencing, 384 kilobit/sec ISDN is emerging as the *de facto* standard. To achieve this high data rate, users must run three BonDed ISDN BRI lines, each of which provides 128 kilobit/sec per line (six B Channels for 384 kilobit/sec). ISDN is a more flexible and cost-effective alternative to the government's traditional method of using dedicated T-1 connections. For example, T-1 connections must be paid for 24 hours a day, seven days a week, regardless of use. ISDN, on the other hand, is available for a nominal monthly fee (per line) plus a small per-minute use fee. For example, in the Washington, D.C., area, the cost of running a videoconference over an ISDN line would be about $38 per month for the line and roughly 2 cents per minute for the use. Therefore, agencies that run at 384 kilobit/sec (three lines) and conduct four 30-minute conferences per month would pay about $40.40 a month. They also would incur a one-time installation fee of about $64. Dedicated T-1 connectivity will cost upwards of $1,000 a month.

For agencies worried about the performance degradation associated with encryption overhead, industry analysts point to the next generation of digital, ISDN-compatible Secure Terminal Equipment being developed by Lockheed Martin Corp., in conjunction with the National Security Agency. This equipment aims to enhance the performance of secure conferencing.

LAN and WAN connections, on the other hand, have plenty of bandwidth but may be hampered by access contention. Rather than providing real-time interaction, LAN/WAN-based systems shuttle data back and forth as bandwidth becomes available.

In addition, analog telephone connections (POTS), although widely available, can only supply a transmission rate of 33.3 kilobit/sec using today's top-of-the-line modems. As a result, your video may be choppy and at times even unreliable, especially in large-scale desktop architectures that still rely on 10Base-T Ethernet.

The following is a rundown of some of the more important aspects of videoconferencing that you should take into account before buying a system. Users should take note of the impact these factors could have on the overall quality of conferencing sessions.

Picture Resolution: H.320 systems will support either QCIF (Quarter Common Intermediate Format — 176-by-144 resolution) or CIF (Common Intermediate Format or Full CIF — 352-by-288 resolution) or both. However, a system supporting CIF that connects to one capable of only supporting QCIF will be forced to degrade its resolution to achieve interoperability.

Frame Rate: H.320 systems can support 7.5, 10, 15 or 30 frames per second (fps). However, frame rates above 7.5fps are not mandatory under the H.320 standard. As a result, systems that support 30fps (TV-quality video) must degrade their performance to conduct conferencing sessions with systems that operate at lower frame rates.

Audio Specifications: H.320 systems are only required to support the G.711 audio standard (48 to 64 kilobit/sec narrowband, which is telephone quality). However, most manufacturers today try to support G.728, which is a 16 kilobit/sec narrowband audio specification that leaves additional bandwidth for video and is also important for lower bit-rate connections. G.722, on the other hand, provides more bandwidth (48 to 64 kilobit/sec wideband stereo) for audio, but this leaves less bandwidth available for video. Higher-end systems will give users the option to choose between better video or better audio.

Agencies should look closely at these features before deciding on a particular vendor or system. Bell Atlantic Federal Systems recommends videoconferencing systems that support G.728 for audio, provide a software migration path to T.120 and support full CIF picture resolution. The important point to remember is that the videoconferencing system you choose should be flexible and upgradable so that your investment is protected as technology advances.

Standards Summary

▶ **H.320** (Umbrella standard for videoconferencing; ISDN)

General
H.221: Frame structure.
H.230: Control information.
H.242: Communication, call setup, protocols.

Video Codec
H.261: Referred to as CIF. Ensures compatibility between countries.

Audio
G.711: Telephone-quality audio. Forty-eight to 64 kilobit/sec narrowband.
G.722: Best audio quality. Forty-eight to 64 kilobit/sec wideband.
G.728: Good for low bit-rate connections. Sixteen kilobit/sec narrowband.

Multipoint
H.231: Defines a multipoint control unit and how to connect three or more H.320 codecs.
H.243: Establish communications between three or more terminals (digital).

Encryption
H.233: How to encrypt information between H.320-compliant systems.
H.234: Encryption key management.

Data Conferencing
T.120: Governs data conferencing (audio/graphic).

▶ **MPEG**: Moving Picture Expert Group. Broadcast and VHS picture quality.

▶ **JPEG**: Joint Photographic Expert Group. Still-image coding for videoconferencing.

Windows 95 installation wizards walk you through setting up the software, which is provided on a CD-ROM. Selecting a full installation will load the most common options for users not familiar with the custom settings. The ISDN setup is similar to that found in the other systems in this review and is very clear-cut.

The Sony system supports videoconferencing over ISDN, Ethernet or Token Ring networks. DataBeam's FarSite software provides electronic whiteboard, file-transfer and real-time application-sharing functionality. It also supports a unique viewing mode called "picture-in-picture," which lets users dynamically insert and resize the local video window within the remote window.

Adding users to the address book and calling users are very intuitive processes. A pull-down menu provides users with the option of enabling or disabling the automatic answering of incoming calls. This helps to accelerate connection times and minimizes user intervention. As with the VTEL system, users can configure the software to automatically enter incoming callers into the address book and can also create user profiles to personalize contact information.

While reviewing the Sony PC Conference system, we ran into a couple of system bugs that prevented us from fully testing the two DVC units. During application-sharing, the Sony system gave us a fatal windows error and caused our PC to crash. After resolving this problem, we experienced another problem; the two Sony systems would not establish an application sharing session. That's why we gave Sony a score of unacceptable in this category.

Sony sent us new DataBeam Farsite software that did not resolve the problem. We also were advised to change various system configuration settings and load a new driver for the video codec board. As of print time, Sony still has not provided us with a fix for the problem. This incident also lowered the company's technical support score because it took a considerable amount of prodding to get Sony to return our trouble call.

The software's whiteboarding feature performed well, although it is a very basic drawing tool with no separate toolbar icon. During basic videoconferencing, video and audio synchronize well, but performance degrades somewhat with faster movements. During file transfers, video clarity remains good but becomes a little jerky as additional movement is added to the background. The same is true for the system's whiteboarding functionality.

With the exception of the application-sharing feature, the Sony system performed on par with the system from VTEL. However, it could have benefited from improvements in ease of use. A two-seat configuration for the TriniCom 500 will cost government buyers $3,990 on the open market. However, at press time, a GSA price was being negotiated.

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fcw.com

Summary

As a technology, DVC is still developing and maturing. However, first-time buyers will find the systems reviewed here to be a cost-effective means of trying it out. All these systems performed well during basic DVC sessions, and all offer excellent compatibility for government buyers with heterogeneous equipment and the need to support industry standards.

The PictureTel Live200p solution was clearly the front-runner in terms of performance. However, if a wide variety of features is what you're looking for and cost is less of a factor, we suggest looking at the system from VTEL. The Intel solution has intuitive software and is priced to sell but provides poor performance at application sharing and file transfers. And the Sony system, while good at other functions, wouldn't work at application sharing. ◀

HOW WE TESTED

Desktop Videoconferencing

Performance

We scored DVC performance in four areas: standard videoconferencing; videoconferencing with application sharing; videoconferencing with whiteboarding; and videoconferencing during file transfer. The total performance score was 225 points, with each section having a weighted score of 50 points, except for videoconferencing with application sharing — the most important feature for most government users — having a weighted score of 75 points.

We evaluated the video synchronization with sound while running these different scenarios. We also looked at how well the video came through while performing these tasks. We looked for dropped frames and jerkiness during the conferencing session. We assigned word scores that were translated into percentages of the points assigned to each category.

Setup

Setup scores were based on how easy it was to install the necessary hardware and software. We gave extra points for single-board solutions and plug-and-play support. For software, we examined how easy it was to install and whether all the necessary software components — such as drivers and license numbers — were included. We graded software setup based on configuring the systems for ISDN support rather than LAN support. We assigned word scores that were translated into percentages of the 125 points assigned to this category.

Ease of Use

For ease-of-use scoring, we looked at how easy it was to use the DVC software during a videoconferencing session (point-to-point). We gave extra points for graphical icons, help bubbles, pop-up windows and status indicators. We examined several different DVC processes, including adding users, calling users, running a whiteboard session, transferring files between VTC nodes and sharing applications such as Microsoft Word and Excel. We assigned word scores that were translated into percentages of the 125 points assigned to this category.

Features

We examined hardware and software DVC features, which differentiated the systems in our review. Examples of features that we scored included camera controls and settings (hardware- and software-based), audio components (handsets, headsets, speaker phones and external speakers), support for full-screen video windows, value-added components (product demos/tutorials, system diagnostics and ISDN line testing) and extra features, such as a business card creator and a built-in telephone answering machine. We assigned word scores that were translated into percentages of the 125 points assigned to this category.

Compatibility

In this scored category, we examined whether the DVC systems supported standard DVC protocols, such as H.320, H.711, H.722, T.120 and QCIF/CIF. In addition, we gave extra points for those systems that supported multiple operating system environments (Windows 3.x, Windows 95, etc.). We assigned word scores that were translated into percentages of the 75 points assigned to this category.

Documentation

At a minimum, documentation had to tell us how to set up and use the system and had to include accurate diagrams to illustrate the text. Comprehensive, well-organized and well-written manuals received higher scores. We lowered the score if the manual was poorly organized, lacked a table of contents and index, did not include information on installing options or contained factual errors in the text. Certain criteria automatically triggered lower scores; for example, a missing system manual was unacceptable, and a missing software manual earned a poor score. Again, we used word scores that were translated into percentages of the 50 points assigned to this category.

Support Policies

A one-year warranty covering parts, labor and unlimited technical support from the vendor earned a satisfactory score. We awarded bonuses for unconditional money-back guarantees, on-site service included in the purchase price, extended support hours, bulletin board support (i.e. CompuServe) and a toll-free number. We subtracted points for no technical support, a limited support period and dealer-only support. We then assigned word scores that were translated into percentages of the 75 points assigned to this category.

Technical Support

We based technical support scores on the quality of service we received during multiple anonymous support calls. We assigned word scores that were translated into percentages of the 50 points assigned to this category.

Price

Price scoring is based on a two-user configuration. Price was scored mathematically. The lowest-priced unit received the total possible points (150). All other systems received a percentage of the total points.

Monitoring Tools

Five Products That Track and Block Internet Traffic

▶ PAUL FERRILL

With the Office of Management and Budget questioning Internet usage among federal employees, government network administrators are under pressure to control and manage access by their users. To meet this need, vendors have introduced a range of software monitoring tools that do everything from track usage to block specific sites. In this comparison, we evaluate the performance of five of these tools and offer advice about which products are best for various applications.

Nothing gets a conversation heated up these days better than the topic of Internet-usage policies. The bottom line for most government users is this: If the Internet activity doesn't apply to the work you are doing, don't do it. The challenge for network managers then becomes how to enforce such a policy.

The first available option is simple monitoring. With this approach, a network manager can determine which Internet sites are being accessed and from which computer. Other statistics include the amount of time spent and amount of data transferred. Using these types of tools provides an easy way to track how employees are using the Internet. It also serves as a powerful deterrent to misuse if users know that their Internet usage is being watched.

The second level of policy enforcement is physical blocking. This type of tool provides the means to implement safeguards such as completely disallowing any transfer of files into your network via the File Transfer Protocol. You also could block access to Usenet newsgroups or specific World Wide Web sites. On the more restrictive side, you could allow access only to approved sites and protocols.

All the products we tested perform the basic functions of protocol monitoring. To do this, they look at each Transmission Control Protocol/Internet Protocol packet and decode the source and destination address as well as the type of message. One factor common to all the products is the need to be physically located on the outgoing segment of your network. That means you'll need to load the software on a machine that sits on the same subnetwork as your connection to the Internet.

Once the TCP/IP message has been decoded, the pertinent information is stored in a database for reporting. Most of the products allow you to specify how much information you want to track in order to prevent the database from getting out of hand. Even if you keep only a minimal amount of information, you can expect this database to require a hard drive of a healthy size. A number of the products also provide a dynamic picture of your network.

Visit our Web site at **www.fcw.com/pubs/gbb**, where hotlinks to the vendors mentioned here are available for your convenience.

The task of blocking requires the product to act as a filter. The ultimate filter would have two network connections to physically separate the network being monitored from the Internet in much the same way as a firewall. Sequel Technology Corp.'s Sequel Net Access Manager 2.01 (SNAM) functions in this manner, with the filtering software looking at each TCP/IP message and deciding whether to pass it on to the Internet. Another blocking technique uses a network sniffer to watch for specific packets and then disrupt them in a spoofing manner. LittleBrother Professional Edition 1.2 from Kansmen Corp. and ON Guard Internet Manager 2.5 from ON Technology Corp. use this approach.

The products we tested range from simple protocol monitoring to full-blown proxy-type filtering and reporting. On the low end, the Internet SnapShot 3.02 product from Tinwald Networking Technologies Inc. provides a basic level of protocol analysis. The next step up is Optimal Networks Corp.'s Optimal Internet Monitor 1.2, which provides a much better picture of what is happening in traffic to and from the Internet but doesn't offer blocking. If, however, your computers already sit behind a firewall, you can probably take advantage of blocking services on the firewall, and you won't need to buy additional software to handle this task.

The three products that provided blocking all perform their tasks well. Kansmen's LittleBrother is the lowest-priced but doesn't provide the functionality of either SNAM or ON Guard Internet Manager. ON Guard is significantly more costly than SNAM, although SNAM requires that you have Microsoft Corp.'s SQL Server installed on a Windows NT machine. If you don't have a copy of SQL Server, the two products cost about the same.

All in all, we found the products to be useful and informative. Optimal Internet Monitor wins our seal of approval for the best monitoring capabilities and user interface. However, if you need blocking capabilities, we recommend SNAM. We had trouble installing this package, but once it was up and running it had very good performance and features.

Optimal Internet Monitor

Optimal Internet Monitor 1.2 offers very good monitoring capabilities as well as a set of graphs and tables that show Internet usage in great detail. A traffic-matrix display helps you visualize where most of your traffic is going.

Installing Optimal Internet Monitor consisted of inserting a CD-ROM and running the setup program. About the only user interaction required is entering license information. Once that is done, you are ready to start monitoring Internet traffic. On the configuration side, Optimal Internet Monitor provides a way to generate alerts based on access to specific Web sites. If someone tries to access one of the monitored sites, you have the options of sounding an audible alarm, displaying a message box and/or logging the attempt in the alert log. We rated installation and configuration very good.

Optimal Internet Monitor does the job of monitoring and displaying Internet usage quite well. The user traffic table shows Internet traffic by Uniform Resource Locator, destination and source IP address, and user name. You can sort the display on any field by clicking on the column title. Double-clicking on a URL brings up another window showing user traffic to that site for the last hour. Another nice touch is the use of the status line at the bottom of the page to present hints and tips on how to use the program from the

AT A GLANCE

Monitoring Tools

Pricing

Ranges widely depending on product features, from $355 for a server version to $4,495 for a 100-user license.

What's Selling

Internet monitoring packages are relatively new and just starting to arrive on the GSA schedule.

Where to Find Bargains

Volume discounts direct from the vendors.

What to Specify

Decide whether you need blocking capabilities in addition to monitoring. If you have a robust firewall, you may be able to get away with a monitoring-only product. Otherwise, you'll need to decide what level of blocking you need.

current display. Right-clicking on a URL brings up a submenu allowing you to look at the site with your default Web browser or to show usage details about that site.

The user interface is well-designed, providing lots of shortcuts to the different features of the program. A judicious use of mouse functions, such as double- or right-clicking, makes it even easier to get the job done. With all that functionality available, we rated performance excellent.

About the only feature lacking in Optimal Internet Monitor is the ability to block sites. The alerting feature allows you to log access to specific sites but not block them. Generating reports is very easy using either the predefined charts and tables or the report wizard. Standard reporting intervals include hour, day, week, month and year, although you also can enter a specific period of time that you want to see. Once you've generated the report, you can save it as a Hypertext Markup Language file or even export the data to a Comma Separated Value file for loading into a spreadsheet or database program.

A throughput traffic map shows in graphical form where users are going on the Internet. Thicker lines denote higher amounts of traffic. With this display, you can quickly see where the bulk of your Internet traffic is going. If you have lots of users going lots of places, this graph can get quite busy. Overall, we rated features very good.

If your site does not need the ability to block Internet usage, then you would do well to choose Optimal Internet Monitor. It provides all the information on Internet usage that you need to enforce your access policies. The clear and concise reporting, coupled with real-time displays, make this product a real winner in the monitoring area.

THE CONTENDERS

- **Kansmen Corp.'s LittleBrother Professional Edition**, available direct from the company. **Score: 6.05**
- **ON Technology Corp.'s ON Guard Internet Manager**, available direct from the company. **Score: 6.00**
- **Optimal Networks Corp.'s Optimal Internet Monitor**, available direct from the company. **Score: 7.65**
- **Sequel Technology Corp.'s Sequel Net Access Manager**, available on the GSA schedule. **Score: 6.95**
- **Tinwald Networking Technologies Inc.'s Internet SnapShot**, available direct from the company. **Score: 5.60**

Sequel Net Access Manager

SNAM 2.01 was without a doubt the most robust product we tested. In return for the robustness, you'll have to put up with a higher level of complexity. It also was very difficult to get installed and running. However, SNAM offers the most complete filtering capability of all the products we tested.

SNAM easily qualifies as the most involved installation of all the products we tested. First, you have to install Microsoft's SQL Server. You also need to make sure you have the proper privileges and passwords for the system and SQL Server administrator accounts. SNAM requires that you have a computer with two Ethernet cards installed so that it can perform the task of filtering packets for blocking purposes.

Once the installation is complete, you must configure users and groups for tracking purposes. SNAM provides a utility to import users from a text file, although you cannot directly import Windows NT user lists. Once the users and groups are configured, you can set up the blocking rules. We had a great deal of difficulty getting the product to run on our configuration and eventually had to rely on the company to get us up and running. Based on all these factors, we rated installation and configuration poor.

SNAM doesn't provide a dynamic view of the current status of your network. Instead, you have to generate a report to get a look at what's going on. However, the resulting reports provide all the information that you can get out of any of the other products. SNAM's user interface looks like an administration console. The main screen displays user and group information, which makes it easy to administer, but less information about Internet usage is displayed.

SNAM really shines in the blocking area. While the initial configuration of individual users may be tedious, it pays off in the ability to block based on individual users or groups. You also can do the standard site blocking and, in addition, you can block the transfer of specific file types such as executables. We rated SNAM's performance very good.

SNAM uses Microsoft's SQL Server for storing all the information used by the program. As a result, you have the reporting capabilities of a full-blown relational database at your disposal. The reporting tool takes you through the process steps of generating a report based on a set of predefined templates. Once you have the right combination of choices, you can save the resulting format for reuse. Saved report formats show up on the file menu for easy access.

Implementing and enforcing an Internet policy is really easy with SNAM's administration console. The main screen has individual tabs for protocols, sites, files and quotas. These tabs allow you to set policies for groups or individual users based on each criterion. A time scheduler lets you block specific protocols by time. We rated SNAM's features excellent.

With the exception of the difficulties we had installing the product, we found SNAM to be the best overall solution for monitoring and blocking Internet traffic. The product offers the highest level of control over blocking at the cost of installation and configuration complexity. The SQL Server-based database and reporting engine provide a solid foundation for storing and reporting information. If you need the capability to block Internet usage, you'll want to give this product a long look.

LittleBrother Professional Edition

Kansmen's LittleBrother 1.2 was one of three products that offer monitoring and blocking. Unlike SNAM, LittleBrother gets the job done without requiring you to reconfigure your network. On the downside, blocking specific sites requires manual entry.

The entire LittleBrother product comes on two floppy disks. Installation was quick and simple, requiring little or no outside intervention. Once you get the product installed, very little is required to start monitoring your Internet usage. Kansmen offers 46 different categories of sites to block, including arts, entertainment, music, shopping and more. To add specific sites to these categories, you must use a separate category editor program. At this time, Kansmen does not provide any insight into what sites make up each category. We rated installation and configuration good.

LittleBrother's user interface provides an ample amount of buttons and icons, although it doesn't seem to follow the latest Windows conventions of using 3-D buttons and icons. The left-hand side of the screen contains a tabbed dialog box providing instant access to usage by user or site. Two individual buttons let you choose usage reports based either on time or volume.

LittleBrother's real-time display of activity provides a clear picture of what's happening on the network at any given time. You also can configure the program to display individual graphical charts of the top 10 users, top 10 sites, and productive or nonproductive sites. Another handy chart shows

HOW WE TESTED

Monitoring Tools

To test the Internet monitoring software, we used a small network with different clients all accessing the Internet through a single point, a 90 MHz Pentium PC running Microsoft Windows 3.51 server and the Multi-Protocol Router software. We got a lot of help from the folks at Gulf Coast Internet (**www.gulf.net**) in setting up a routable dial-up connection for this test. Other clients on the network ran Windows 3.11, Windows 95 and Windows NT 4.0 workstation. All computers were assigned static Internet Protocol addresses from the same Class C subnetwork.

We scored installation based on how difficult the product was to install, how long the process took and how much user interaction was required. We assigned word scores and then translated them into a percentage of the 150 points awarded to this category.

We looked at performance from the perspective of how well the product monitored Internet usage. Extra points were awarded for products that provided buttons or icons that made it easy to see different types of information. Points were subtracted if the product was difficult to use or if the user interface was not intuitive. We assigned word scores and then translated them into a percentage of the 225 points awarded to this category.

To score a product's features, we looked for a basic set of tabular and graphical reporting tools. Because three of the five products also included the ability to block Internet traffic, we awarded extra points for this feature. We also awarded extra points if the product offered additional network monitoring tools. We assigned word scores and then translated them into a percentage of the 225 points awarded to this category.

We scored support policies based on a standard set of criteria, including cost, support hours and electronic access. We assigned word scores and then translated them into a percentage of the 100 points awarded to this category.

We also made calls to each company's technical-support line to judge the quality and responsiveness of their technical-support staff. We assigned word scores and then translated them into a percentage of the 100 points associated with this category.

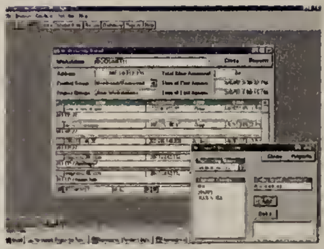
We evaluated each product's on-line and printed documentation based on how easy it was to find answers to specific questions. We assigned word scores and then translated them into percentages of the 100 points awarded to this category.

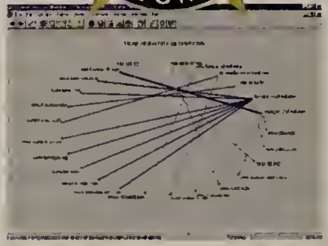
For price, we looked at how much it would cost to monitor a 100-node network. We assigned word scores and then translated them into percentages of the 100 points awarded to this category.

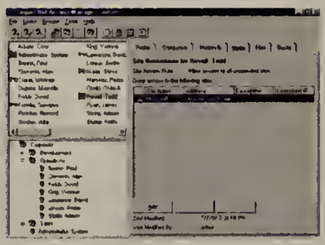
Compatibility of Internet Monitoring Tools

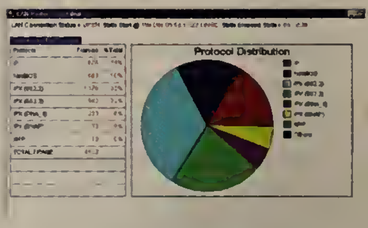
Product	Protocols Supported	Network Environments
Kansmen's LittleBrother Professional Edition	HTTP, FTP, Telnet, SMTP, POP3, NNTP	Windows NT, TCP/IP Networks
ON Technology's ON Guard Internet Manager	HTTP, FTP, Telnet, Gopher	Windows NT, TCP/IP Networks
Optimal Networks' Optimal Internet Monitor	HTTP, FTP, NNTP	Windows NT, TCP/IP Networks
Sequel Technology's Sequel Net Access Manager	HTTP, FTP, SMTP, POP3, NNTP, Gopher and any protocol identified by port	Windows NT, TCP/IP Networks
Tinwald's Internet SnapShot	HTTP, FTP, Telnet, SMTP, POP3, NNTP, IRC	Windows 3.x, 95, Novell Networks

Internet Monitoring Tools Compared









Products receive ratings from excellent to unacceptable in certain categories. Scores are derived by multiplying the weighting of each criterion by its rating, where:

- ★★★★★ = Excellent = 1.0 Outstanding in all areas
- ★★★★ = Very Good = 0.8 Meets all essential criteria and offers significant advantages
- ★★★ = Good = 0.6 Meets essential criteria and includes some special features
- ★★ = Satisfactory = 0.4 Meets essential criteria
- ★ = Poor = 0.2 Falls short in essential areas
- ● = Unacceptable = 0.0 Fails to meet minimum standards or lacks a feature

Scores are summed, divided by 100 and rounded down to two decimal places to yield the final score out of a maximum score of 10.0 (plus bonus). Products rated within 0.2 points of one another differ little.

	WEIGHTING	LittleBrother Professional Edition	ON Guard Internet Manager	Optimal Internet Monitor	Sequel Net Access Manager	Internet SnapShot
Company		Kansmen Corp. (800) 200-9881 www.kansmen.com	ON Technology Corp. (800) 767-6683 www.on.com	Optimal Networks Corp. (415) 845-6333 www.optimal.com	Sequel Technology Corp. (800) 973-7835 www.sequeltech.com	Tinwald Networking Technologies Inc. (800) 546-5843 www.tinwald.com
Installation/ Configuration	150	★★★ 90.00 Simple, two-disk installation. No way to view existing blocking rules.	★★★ 90.00 CD-ROM installation with a good bit of configuration required to implement blocking.	★★★★ 120.00 CD-ROM-based installation with very little user interaction.	★ 30.00 Most involved installation of all the products. Configuration required multiple steps. Could not get product working without tech support help.	★★★★ 120.00 Easy two-disk installation required very little intervention.
Performance	225	★★★★ 180.00 Presents real-time display of activity in graphical and tabular form.	★★★ 135.00 No real-time displays but good user interface with drill-down capability to get to details.	★★★★★ 225.00 Informative real-time displays with lots of shortcut keys and buttons to make the job easy.	★★★★ 180.00 No real-time displays but very flexible user interface targeted at administration.	★★ 90.00 Real-time displays show impact of Internet traffic but not specific workstations.
Features	225	★★★ 135.00 Good set of predefined reports complemented by report wizard. Blocking not as robust as others.	★★★ 135.00 Canned reports with no user modification. Blocking very flexible, including phrase dictionary.	★★★★ 180.00 Useful reports and flexible report wizard but no blocking.	★★★★★ 225.00 Flexible reporting, including charts and tables. Blocking most robust of all the products tested.	★★ 90.00 Limited reporting capability of print screen only. No blocking capability.
Documentation	100	★★★ 60.00 Installation and quick-start manual plus printed user's guide cover all aspects of the program.	★★★ 60.00 Quick-start manual helpful, with all other documentation on-line.	★★★ 60.00 All documentation was on-line but clear and helpful.	★★★ 60.00 Installation manual helpful; some user documentation available. On-line help well-organized and indexed.	★★★ 60.00 On-line manual with good index and context-sensitive help.
Technical Support	100	★★★ 60.00 Very helpful technicians with no hold time.	★★★★ 80.00 Very knowledgeable technicians who answered questions right away.	★★★ 60.00 Quick response; all questions answered.	★★★★ 80.00 Helpful technicians answered questions easily with little to no waiting.	★★★ 60.00 Didn't get through on the first call but received a prompt call back with answers to all questions.
Support Policies	100	★★ 40.00	★★★★ 80.00	★★★ 60.00	★★★ 60.00	★★★ 60.00
Money-Back Guarantee		30 days	30 days	Yes	Yes	No
Free Support		60 days	Yes	Yes	60 days	Yes
Toll-Free Line		No	Yes	No	Yes	Yes
Support Hours		9 a.m. — 5 p.m. M-F (PST)	9 a.m. — 5 p.m. M-F (EST)	9 a.m. — 5 p.m. M-F (PST)	6 a.m. — 6 p.m. M-F (PST)	9 a.m. — 7 p.m. M-F (EST)
Government Price (as of April 14)	100	★★ 40.00	★ 20.00	★★★ 60.00	★★★ 60.00	★★★★ 80.00
Price for 100 Users		$2,246	$4,495	$1,275	$2,924* (estimated GSA price)	$355
Reseller		Kansmen	ON Technology	Optimal Networks	GTSI	Tinwald
Phone		(800) 200-9881 The price for 10 users is $371. Higher-volume discounts are available.	(800) 767-6683 The price for 50 users is $2,695. This product should be available on a contract soon.	(415) 845-6333 This product is priced by the server, regardless of how many users are connected.	(800) 999-4874 One server pack is available for $649 (includes five licenses), and 100 additional licenses cost $2,275.	(800) 546-5843 This product is priced by the server, regardless of how many users are connected.
Final Score	1000	**6.05**	**6.00**	**7.65**	**6.95**	**5.60**
Remarks		**LittleBrother was the only blocking product that also provided real-time displays. Limited insight into blocking rules made it hard to determine if the site you want to block is included or not.**	**ON Guard Internet Manager offers some features that none of the other products had, such as a phrase dictionary and the ability to capture Internet search terms. It was also the most expensive of all the products tested.**	**Optimal Internet Monitor has the best overall Internet monitoring capability, along with the best user interface. However, it doesn't offer blocking.**	**SequelNet Access Manager was the most troublesome to get installed and running. It was also the only product to offer a firewall-like blocking capability. If it weren't for the installation problems, this product would have won.**	**Internet SnapShot provides a good look at how Internet protocols affect your network but not much more. While it was the least expensive of all the products, it also offered the least amount of information.**

*This product requires Microsoft SQL Server.

all the IP addresses and associated Media Access Control addresses and computer names discovered by LittleBrother. Our rating for performance was very good.

Generating reports was especially easy with LittleBrother. The Reports menu offers 17 predefined reports from which to choose. A report wizard guides you through the process of generating your own custom report, although the options are somewhat limited. LittleBrother also can automatically send reports and alerts to a specific electronic-mail address.

A node filter option allows you to see a filtered report showing only a specific IP address or a range of addresses. The only catch is, you'll have to manually select individual IP addresses.

Configuring the product for blocking is easy. Options include specific sites by IP address, name or generic category, and specific services such as FTP, Network News Transfer Protocol, Simple Mail Transfer Protocol and more. The blocking rules can be applied to all users or specific users by IP address. We rated LittleBrother's features good.

Overall, the LittleBrother product provides a good base of information that you can use to monitor Internet activity on your network. There also is a method that seems to work for blocking access to specific sites. What's lacking is a little more insight into the determination of categories and how they're made up. Although the user interface is a little behind the times, it is functional and task-oriented.

ON Guard Internet Manager

The installation process for ON Guard 2.5 was relatively painless. Running the setup program from CD-ROM was straightforward. ON Technology suggests a 100 MHz Pentium PC for the server and at least a 66 MHz 486 for the administrator machine. The company also recommends a 3Com Etherlink III Interface card or equivalent. The hitch here is that the card must be able to handle Promiscuous Mode.

Configuring the product for blocking can be rather tedious. First, you must set the control group default for all workstations as restricted. Next, you have to manually configure every workstation as monitored/restricted. Finally, you must build your own

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INTERNET

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list of restricted sites that you don't want your users accessing. (Some Web sites use multiple IP addresses for the same URL, so if you try to block access to **www.nfl.com**, you actually have to block at least three different IP addresses.) We rated installation and configuration good.

Like Sequel's product, ON Guard presents all its information in report form. All data logging is sent to a database, which must then be queried to generate any type of report. The user interface is intuitive and easy to use but without all the extra touches of Optimal Internet Monitor. ON Guard uses a drill-down approach to present summary information with buttons that let you access the details at the next level down.

ON Guard performs the blocking task in much the same way as LittleBrother. One difference is the search dictionary, which lets you enter word or letter patterns that you wish to identify in Web traffic.

To determine if a new site contains words from the bad list, you must run a report that scans through the contents of the site looking for words from the search list. If any are found, you can then add this site to the list of blocked sites. At this time you can't block Internet chat rooms, newsgroups or e-mail. We rated performance good.

ON Guard provides a number of predefined reports, but you can't customize or modify these reports. You can export a report to a Microsoft Word document, but there is no provision for exporting data for use by a spreadsheet or database program.

You also will need to make sure you have a printer driver installed for your administration computer, or else you will not be able to see reports at all. This also is true for the Sequel product. All in all, we rated ON Guard's features good.

We found ON Guard to be fully functional and capable of performing all the tasks of Internet monitoring and blocking. While not quite as robust as the Sequel product, it covers all the basics with little extras. The biggest strike against the product is its price, which is based on the number of users on your network.

Internet SnapShot

Internet SnapShot 3.02 from Tinwald was the least expensive package that we tested. It also was the weakest in terms of performance and features. About all you can do with this product is get an idea of how Internet traffic is affecting your network. One nice feature of the product is the graphical network topology map showing all stations present on the network.

Installing Internet SnapShot was a breeze. Tinwald recommends a Pentium processor with 16M of memory running either Windows 3.x or Windows 95. Windows NT is not supported as of this release. You also will need a network interface card capable of supporting Promiscuous Mode. Once installed, there is very little to do in the way of configuration because the program does not do any logging or blocking. You can configure the different displays to show the information of most interest. We rated installation and configuration very good.

From a network impact point of view, Internet SnapShot does a very good job of showing the details of how specific protocols affect your network. The first graphical screen that comes up looks like an array of five analog speedometers showing rates, volume and bandwidth utilization. From there you can launch a whole battery of graphical and tabular data showing information on the local-area network as a whole or on specific workstations.

Ample buttons, pop-up tool tips and drop-down menus make the user interface intuitive and easy to use. We had no problems viewing information about our network and little need to refer to the on-line help or manuals. From a real-time perspective, Internet SnapShot provides a good mix of information that can help you determine what is happening on your network. We rated performance satisfactory.

Internet SnapShot depicts data in a variety of ways. From the LAN perspective, you can view usage, activities, protocol distribution and the top 10 users and activities. At the workstation level, you can look at protocol distribution, Internet usage and Internet activities. A print screen feature lets you send a copy of a window to the printer.

This product works more like a network monitoring tool than an Internet analysis device. Internet SnapShot does not have the ability to log data to disk or to block outward-bound packets. That means you will not be able to do any long-term trend analysis. Overall, we rated features satisfactory.

Internet SnapShot does a good job of simply monitoring the Internet traffic on a network. It does not attempt to block a site or keep a large database of network activity. All work is accomplished in real time, providing immediate feedback as to the current state of your network. With a simple installation process and nonintrusive setup, you can use this product from anywhere in your network. You will, however, need to run your copy of the program on the segment of your network physically attached to the Internet router if you have one. ◄

Ferrill, based at Eglin Air Force Base, Fla., is associate principal engineer at Sverdrup Technology.

OFF THE SHELF

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ALR Unveils Six-Processor Server

Advanced Logic Research Inc., Irvine, Calif., announced in March the computer industry's first six-processor PC server, which was designed to watch over mission-critical government data.

The ALR Revolution 6x6 comes in either floor or rack-mountable models. Central to the system's design is its support for up to six 200 MHz/512K Pentium Pro processors, 128M of ECC RAM, six RAID-ready drive bays, 9G of hard drive space, 12 expansion slots, a redundant power supply and a 16X CD-ROM drive. The system's ECC memory can be expanded up to 2G. ALR also has plans to incorporate support for up to 4G of DIMM memory in the future.

The server comes with ALR's InforManager feature, which relays critical system information collected by more than 30 sensors to network and systems administrators.

Also included is ActiveCPR, a CPU fail-over and recovery utility designed to protect a symmetric multiprocessing environment from processor or software failures.

The Revolution 6x6 was designed for the growing and expanding enterprise. Buyers can opt for a single- or dual-processor system and add the additional Pentium Pro processors as needed.

In addition, the Revolution 6x6 is also highly expandable and flexible, supporting six hot-swappable drives for a total of up to 78G of fixed storage capacity. Users can run a variety of software on the platform, including Windows NT (SMP), Novell NetWare (SMP), IBM OS/2 (SMP) and SCO Unix (MPX/SMP) as well as Sun Solaris (SMP) and UnixWare (SMP).

Pricing for a base configuration starts at $13,995. For more information, contact ALR at (800) 444-4ALR or via e-mail at Sales@alr.com.

— Daniel M. Verton

STATE AND LOCAL

VSC Eyes Local Law Enforcement Agencies

Video Surveillance Consultants has historically provided federal law enforcement and security professionals with state-of-the-art closed-circuit TV devices for covert surveillance. Now the Gaithersburg, Md.-based reseller is offering one-stop shopping and related services to state and local agencies as well.

According to VSC president Ross Kruglak, "The entire focus of our company is to help further the efforts of law enforcement and protection agencies" by placing the "right devices in the right hands and at the right prices."

The company provides an extensive list of miniature board cameras, lenses, zoom lenses, monitors, pinhole cameras and devices to hide cameras at factory-direct prices for law enforcement officials only. Potential buyers can choose products from Marshall Electronics Inc., Ameba Technology Inc., Nastechnologies Inc. or MPS Inc., to name just a few. Government credit card orders are welcome.

An example of the type of products offered by VSC is Marshall's V-1055 black-and-white CCD Camera, a low-light camera measuring only 1.5 inches that uses a 25mm pinhole lens. The reseller also offers low-light and high-resolution industrial and scientific cameras and optical devices, including color board cameras, which can be incorporated into computers for teleconferencing, multimedia or identification.

While the company recently targeted its sales efforts at state and local law enforcement agencies, VSC's products and services are in use at several federal agencies, the Defense Department and within the intelligence community.

For more information on VSC, call (301) 948-5462 or e-mail rkruglak@ix.netcom.com.

— Daniel M. Verton

PC Preview

What to Expect This Summer

▶ DAN CARNEY

A dizzying array of new PC technologies will hit the market this summer. Some, like MMX processors, are already there. Others, like 56 kilobit/sec modems, are due out soon. Read this story to find out what new features will hit the market in the next several months and whether you should buy them.

Federal PC buyers can expect to be alternatively dazzled and dazed by a bewildering array of emerging PC technologies this year. After several years with little change in the status quo, PC makers and their component suppliers are offering a slew of new bells and whistles.

"This year is going to be one of the craziest years in a long time, with regard to new technology," said Chuck Spence, director of marketing for Dunn Computer Corp., Sterling, Va.

"I think you will see a lot of new product initiatives this year, more so than in years past," agreed Bart Brown, director of desktop products for Gateway 2000 Inc.

During the peak summer buying season, federal buyers will have more choices than ever, including new MMX and Pentium II processor technology from Intel Corp., Windows 97 software from Microsoft Corp., two competing standards for 56.6 kilobit/sec modems and new Digital Video Disc storage systems.

"The difference between PCs won't be processor speed, it will be complete system capability," said Bob Guerra, president of Robert J. Guerra and Associates, a federal reseller consultancy.

PCs with the new features will hit the market more quickly than in the past because of streamlined certification with the Federal Communications Commission, Spence said. In the past, PC makers had to certify each new model, which could delay shipment for weeks, he said. Now, if a manufacturer uses a system board and power supply certified by their respective manufacturers, the resulting PC is considered compliant and can be shipped immediately.

The questions for federal buyers are, Which new features are worth having, and when will they arrive?

The answer depends on the applications the PC will run. The Internet is driving many of the changes, Guerra said. "Internet/intranet is going to be the primary application federal customers need," he said. "The business processes are all [World Wide] Web-driven."

The added computing power of new systems will itself attract applications that were not practical before, said John Dunkle, president of Workgroup Strategic Services Inc., Portsmouth, N.H. "It is inviting new applications like modeling, imaging and document processing," he said. "The hardware will be there to make them usable on commodity-class systems."

Below is a summary of the new technologies federal buyers can expect to see in the following areas: processors, software, memory, disk drives, monitors, add-in cards, modems and peripherals.

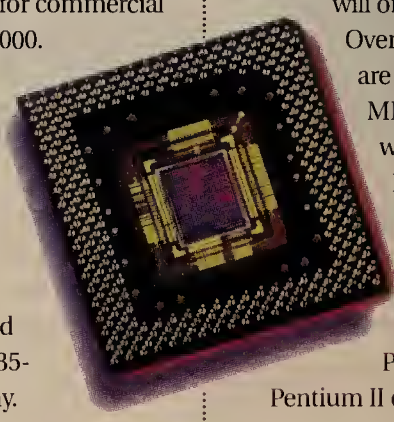
Processors

Intel has come out with two new processor technologies for buyers to consider: Pentium MMX and Pentium II, which is essentially the Pentium Pro with MMX. MMX consists of 57 new instructions designed to speed up multimedia applications.

Meanwhile, rival chip makers Advanced Micro Devices Inc. and Cyrix Corp. are coming out with new chips that promise to match Intel's offerings at lower prices. If they succeed, PC makers will be able to offer customers more computing horsepower for less money, which is always good news. In fact, it's a no-lose situation for buyers because even if the AMD K6 and Cyrix M2 fall short of their ambitious goals, Intel will be forced to respond to their presence.

That means newer, faster, better and cheaper Intel chips designed to make alternatives look less attractive. "Historically, when the competition has come out with processors, Intel has responded," said Craig Marzolf, product manager for commercial lines at Gateway 2000.

The Pentium MMX enjoys more than just multimedia-optimized instructions; it also has twice the on-chip cache memory and uses Intel's latest .35-micron lithography. The company's stated plan was for 200 MHz to be the end of the line for the Pentium chip, but the upgrades open the door to faster speeds.



"The addition of multimedia enhancement technology has pumped added life into the Pentium product line," said Howard High, an Intel spokesman. Using the latest lithography techniques to etch smaller circuits lets the Pentium MMX run at a lower voltage internally than the older chips, which reduces heat dissipation, the enemy of higher clock speeds. Now "the thermal [concerns] are not an issue," High said.

Intel revamped the Pentium Pro even more thoroughly when adding MMX circuits. The new chip is known as Pentium II, and it introduces a whole new layout, or form factor, in industry jargon. The familiar square processor socket is gone. Intel mounts the Pentium II on a card, called a Single Edge Contact (SEC) cartridge, along with separate cache memory. It slides edgewise into a slot like an expansion card.

This means that manufacturers will have to use entirely different motherboards for Pentium II machines than they use for Pentium or Pentium Pro systems. Pentium and Pentium MMX PCs can use the same motherboard, as long as it uses the correct chipset that recognizes the two chips, which get installed in the same socket.

Intel says the SEC cartridge will let it offer higher-performance processors in the future. Intel has demonstrated a Pentium II chip that runs at 400 MHz, but the company is shipping units at clock speeds of 233 MHz and 266 MHz.

Customers will like the SEC design because it offers better upgradability, said Mark Thoreson, inside sales manager for Chantilly, Va.-based reseller Government Technology Services Inc.

Intel is not saying whether it will offer Pentium Pro Overdrive chips that are enhanced with MMX to customers who already own Pentium Pro systems. The company does say, however, that it plans to continue the Pentium Pro and Pentium II chips.

While Pentium MMX and Pentium II chips will ship primarily in desktop systems, Pentium Pro is likely to be the preferred architecture for servers.

The format change for Pentium II means that PC makers will not be able to use the same motherboard for systems with Intel, AMD or Cyrix chips. That's because the other companies built their chips to be compatible with the Pentium Pro design.

Visit our Web site at **www.fcw.com/pubs/gbb**, where hotlinks to the vendors mentioned here are available for your convenience.

fcw.com

The question for buyers is, Which chips will be popular and affordable this summer? It appears that Pentium MMX, with clock speeds of 200 MHz and up, will be the sweet spot.

"Pentium is a lot more cost-effective for people until Intel decides to get more aggressive on the Pentium II pricing," Marzolf said.

Pentium II PCs will start to appear late in the second quarter and should be common by the height of the summer buying season. By the end of the year, Pentium II will have a "significant" share of the market, Brown said. "I don't expect to see a lot of Pentiums in the market by this time next year," he said.

Operating Systems

One factor driving the switch to Pentium Pro or Pentium II-based systems is the adoption of Microsoft Windows NT 4.0 as an operating system by federal customers. Pentium Pro and Pentium II chips use the same Intel P6 core, which is optimized for the 32-bit operations in Windows NT. Systems using these chips show significant performance gains over Pentium MMX in this environment. "Applications get some tremendous performance benefits by going to all 32-bit [hardware and software]," High said.

Consumers will stick with Windows 95 and Windows 97 when it is released this year, but networked federal and business customers will probably opt for Windows NT, according to Marzolf. Windows NT also will gain ground when Microsoft finally stops selling Windows 3.11. This will force the last Windows 3.11 holdouts to convert. Many will skip Windows 95 and 97 and move straight to Windows NT, he predicted.

Windows NT holds about a quarter of the operating system market now for networked customers, and that share will grow to about 35 percent by the end of the year, he said. "NT really has a lot [of advantages] in terms of cost of ownership," Marzolf said.

Spence is more bullish on Windows NT in the federal market. Half the PCs he ships to federal buyers now have the operating system installed, and that portion will rise to two-thirds by the end of the year, he predicted.

Windows NT sales to government customers have grown with a 155 percent compound annual growth rate since 1994, according to Dunkle. Total growth has been nearly tenfold during the period.

Memory

Another semiconductor chip inside PCs that has been much in the news is the dynamic RAM. This component used to be one of the most costly components, but dramatic price cuts have left PC buyers opting for much more RAM than in the past.

Some observers voiced concerns that chip makers would slash production in response to low prices and push memory prices back up. Dataquest analyst Ron Bohn said prices will continue to slide in spite of production cutbacks by Korean suppliers, but at a less precipitous rate than in 1996. "There is an enormous production of 16M DRAM, and this will extend the oversupply into 1998," he said.

Federal PC buyers are packing their PC memory purchases onto more dense Double In-line Memory Modules (DIMMs) instead of the old Single In-line Memory Module (SIMM) arrays, according to Thoreson. "DIMMs have become very popular," he said. "We don't get as many orders for SIMMs anymore."

With memory prices low, most federal buyers will opt for 32M of RAM instead of 16M in their desktop PCs, vendors said. The new 32-bit software, such as Windows NT, also makes 32M of RAM a smarter choice.

Disk Drives

Meanwhile, hard disk technology continues its seemingly endless increase in capacity per platter. Two-gigabyte drives are standard now, but by the end of the year 3G drives will by typical, and 6G drives will be common on high-end PCs, observers predict.

One innovation is that hard drive maker Western Digital Corp. has developed a way to wire the hard drive between the CD-ROM drive and the rest of the PC so that the hard disk can serve as a cache for the slower CD-ROM.

Industry is also offering several schemes to improve the speed at which hard drives get their data to the PC. One is called Ultra DMA, a new standard that will begin to appear on PCs this summer. The other, faster connection will use a fiber-optic hard disk controller, which will be built into some system boards this summer. Alternatively, Dunn plans to offer a separate controller for customers who want to add this feature.

Overall, federal buyers should buy the largest hard drives they can afford — at least 2G, and larger if possible. Ultra DMA and competing technologies should make running applications or accessing data off the hard drive a faster process.

17-Inch Monitors

Because processor and RAM prices are falling, federal buyers may have money left over to upgrade their monitors. In particular, buyers are opting for 17-inch monitors, which have also become more affordable.

"The 17-inch is the de facto standard. I don't think there is an order for a 15-inch monitor on my desk," Thoreson said.

The reason for strong interest in 17-inch displays is obvious, Guerra said. In a multitasking, multimedia computing environment, "how do you do a number of different things on a 15-inch monitor?" he asked. "You can't."

If you can afford a 17-inch monitor, you should go ahead and buy one. Currently, these systems cost about $600.

Add-In Cards

Mainstream PC video adapter cards will continue to evolve toward the real-time 3-D rendering capability of high-powered technical workstations, but the progress will be in baby steps, High said. While current PCI bus 3-D cards are good, "we have a way to go," he said.

Network interface cards (NICs) will move quickly to the 100 megabit/sec speed, but end users won't see the benefits for a year or two, High said. The reason is that all of the PCs on a network have to have 100 megabit/sec cards installed, and the hub or server has to support the higher speed. Once most PCs have the cards in place, then offices will make the switch by changing the server or hub and upgrading the stragglers.

"It could be several years before the networks change over," High said.

56 Kilobit/Sec Modems

One area of confusion for buyers is in dial-up telecommunications. The market is offering two competing standards for 56.6 kilobit/sec modems: one supported by Motorola Corp. and the other by U.S. Robotics. Buyers are looking for a single standard.

True, U.S. Robotics was first out of the gate with the new, faster modems, but whether the company can hold that lead remains to be seen. The good news is that the company's modems are software-upgradable, so whichever standard wins, the U.S. Robotics modems should ultimately support it. Whatever standard Internet service providers choose will be what becomes popular with buyers, Dunkle said. "Now [56.6 kilobit/sec modems] are all dressed up with no one to talk to," he said. "Most ISPs out there are 28.8 kilobit/sec."

Buyers will need to decide whether they want to be on the bleeding edge with 56.6 kilobit/sec modems or whether they're better off sticking with the 33.3 kilobit/sec units in many PCs.

Peripherals

A new storage technology, Digital Video Disc (DVD), will begin to show up during the fiscal 1997 buying season. Coming from the consumer electronics market, DVD stores an entire movie on a CD-ROM-size disc. After years of debate over the standard, this technology will begin appearing in PCs this year and could be common by the end of the year.

Meanwhile, PC manufacturers are shipping 12X and 10X CD-ROM drives with systems, which are particularly nice for multimedia applications. If you buy an MMX-enabled PC, you might want a faster CD-ROM drive.

Increasingly, external CD-ROM or DVD drives will be attached to PCs via Universal Serial Bus ports, which are shipping in many new PCs. A USB port lets a user connect peripherals such as keyboards, mice, joysticks and modems in a plug-and-play fashion. Few federal PC users need a CD-ROM drive on a daily basis, so many agencies buy PCs without them and use an external drive to install software, which usually comes on a CD-ROM. As more software applications can be installed over a network, users only need to use a CD-ROM drive when they're installing new operating systems. For these users — and their systems administrators — a USB-connected CD-ROM drive would be a good solution, Thoreson said.

PC Alternatives

As PC manufactures pack their desktop products with new features, a movement toward server-based computing is building steam in the guise of the network computer. The first NCs are hitting the market now, but it is unlikely federal agencies will buy them in large volumes this year.

"I expect that many of the functions that the average user does — such as e-mail, word processing, spreadsheet and calendar — can easily be done using an NC and Java-based applications," said Chip Bumgardner, senior vice president and chief technical officer of BTG Inc. The reason buyers might be interested in this new kind of computer is the lower cost of operation. The annual cost of maintaining an NC will be about $2,500, vs. $8,000 to $12,000 for a traditional PC, he said.

With so many variables, the state of the PC by the end of the year could be any of a thousand possible combinations. We will just have to wait and see.

"These are exciting times," Thoreson concluded. ◀

Carney is a Federal Computer Week *contributing writer.*

Time Line for 1997

Q2

- ▶ Pentium II ships.
- ▶ Pentium MMX ships on most machines.
- ▶ 56.6 kilobit/sec modems ship in volume.
- ▶ Ultra DMA hard drives ship.
- ▶ DVD drives ship.
- ▶ 17-inch monitors ship on most machines.

Q3

- ▶ USB port ships on most machines.
- ▶ USB peripherals ship in volume.
- ▶ Hard drive density reaches 2G per platter.
- ▶ Fiber-optic hard disk controllers integrated on system boards.
- ▶ Pentium MMX chips ship at faster-than-200-MHz speeds.

Q4

- ▶ DVD drives on many machines.
- ▶ Windows NT ships on most machines.
- ▶ 21-inch monitors ship on many machines.
- ▶ 56.6 kilobit/sec modem standard set.

1998+

- ▶ Flat-panel display becomes cost-effective.
- ▶ Pentium II on most machines.

NetworkWorld
TECHNICAL SEMINARS

NEXT GENERATION MESSAGING

Capitalizing on Internet & Client/Server E-mail

Enterprises across the world are eager to capitalize on Internet and client/server E-mail as a universal infrastructure utility for supporting vital groupware and electronic commerce applications. However, neither monolithic proprietary mail systems nor yesterday's shareware mail packages can successfully support high-volume, mission-critical applications on your Intranet, Extranets, or the Internet at large.

Internet and client/server messaging systems are based on proven yet dynamically evolving standards. Thanks to the wide acceptance of the standards, intense user demand, and strong vendor leadership programs, Internet and client/server mail products are becoming more robust and flexible. Through the smart deployment of messaging products that add value in the areas of standards, security, directory, management, and applications integration, enterprises can build sustained competitive advantage in a cost-effective manner.

Capitalizing on Internet & Client/Server E-mail will help you decide what services you need from client/server Internet messaging, and what benefits your company can expect from upgrading to the latest standards and technologies. You will learn how, when, and why to deploy products supporting new standards like Multipurpose Internet Mail Extensions (MIME), Internet Message Access Protocol 4 (IMAP4), Extended Simple Mail Transfer Protocol (ESMTP), and the Lightweight Directory Access Protocol (LDAP).

This seminar, taught by Daniel Blum of Rapport Communication, a leading expert in messaging, will also cover best practices for evaluating and selecting messaging products, lowering cost of ownership, migrating from legacy mainframe or LAN E-mail systems to client/server messaging systems, and sending information securely over the Internet. It covers tricky deployment issues, such as how to use mailing lists, message switching backbones, X.500, directory synchronization, and mail monitoring software.

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6. Plan directory integration using LDAP, X.500, and meta-directories
7. Practice "safe messaging" using PGP or S/MIME
8. Assess "do's and don'ts" message-based electronic commerce
9. Analyze vendor product positioning
10. Evaluate Internet service provider (ISP) messaging connectivity or management support for small, mid-sized, and large enterprises
11. Understand and take advantage of different product/service pricing structures
12. Follow best practices for messaging administration, help desk, and management
13. Use proven methodologies for planning strategy, migration, procurement, and deployment
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ACQUISITION ANSWER MAN

Q. Thanks for the nice review of color printers [*GBB*, Feb. 3]. The Tektronix printer looks good, but I have a nagging question. I have my HP LaserJet printers under maintenance with a local company. The maintenance guys tell me that no other printer is made as well as an HP. We still use our LaserJet IIs and IIIs, and some of them have never gone down. That would make the IIs almost 10 years old and still chugging. Will I get this kind of service from a Tektronix? Will the maintenance guys be able to fix it if it breaks one, two or three years from now? You need to include this information in your evaluations. For now, I will stick with old, faithful HP.

Robert Kambic
Director of Computing
Hopkins Population Center
Hopkins Center on the Demography of Aging
Department of Population Dynamics

A. It's a testament to HP that you are such a satisfied customer. The HP printer ranked second overall in our comparison of color laser printers, with decent performance scores and high-quality images. In some categories, such as image quality and system design, the HP unit scored higher than the Tektronix printer. Overall, we found it to be a good system, especially for large print jobs.

Whether you choose an HP, a Tektronix or another printer, we can't guarantee your printer won't break down tomorrow. However, our comparisons try to address product maintenance with our technical support calls and evaluation of companies' support policies. Both Tektronix and HP received excellent scores for technical support and good scores for support policies.

For your information, Tektronix offers TekColor Care Service Plans that include installation and setup. A one-year warranty is standard, and the company offers full on-site service for one to three years. Tektronix provides technical support via the World Wide Web, an on-demand fax reference library, an electronic bulletin board and a quarterly newsletter about color printing. Unlimited, one-on-one telephone support is at your call during regular business hours.

Still, if you're happy with HP, by all means, stick with it. However, if you're in the market for something new, take a look at the Tektronix offerings.

Q. Regarding the Pentium server review in *Government Best Buys'* March 3 supplement, I would like to have your opinion on the use and possibilities of the Linux operating system compared to Unix and Windows NT. In the article, it is mentioned that Windows NT is probably the operating system of choice in the government. One reason is affordability. However, in view of performance and cost, Linux appears to be a more attractive alternative than Windows NT.

Received via e-mail

A. This question of whether government buyers should consider Linux over Unix and Windows products is one that I get from time to time. Our test center has not evaluated Linux or Unix products in direct comparison with Windows products to date. However, we did review Caldera Inc.'s Caldera Network Desktop, a commercialized version of Linux, last July, and we gave it a score of good. We found the software easy to install and configure and — at $99 a copy — very affordable compared with other versions of Unix. You can access that review on our Web site at **www.fcw.com/pubs/gbb**.

While Unix products have solid supporters in the government, industry research shows a growing trend toward Windows NT. According to a recent survey of *Federal Computer Week* readers, in server operating systems, Windows NT and Unix have virtually the same percentage of total sites. However, in the percentage of planned installations for next year, Windows NT is almost double that of Unix. (However, Novell Inc.'s NetWare currently has a higher percentage of sites than either Unix or Windows NT, but growth in planned installations is below that of Unix or Windows NT.) Buyers need to make sure that the network operating system they choose offers the security, stability and scalability that they need.

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Does your organization use teleconferencing gear?

How do you use it?

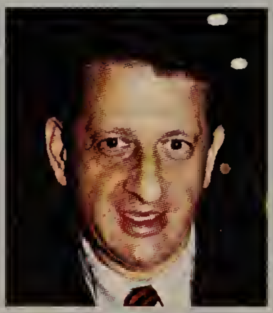
PHOTOS BY STAN BAROUH

"No. But I imagine that eventually they'll get it down [to us]. The generals usually have it at their level."

— Tech. Sgt. Rob Banaszak, manager of command and control with the Air Force Pentagon Communications Agency, said his office doesn't really need the equipment right now.

"Yes. As far as I know, it's being used daily."

— Will Geer, coordinating Webmaster for the National Science Foundation, doesn't use the equipment himself but says others use it to connect with the academic community.

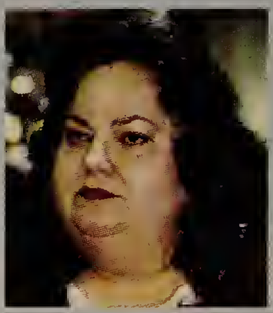


"Not today, but we'll look at it. Unless we can do it cheaply, we won't put a lot of money into it."

— Fred Kruger, information systems director for Albemarle County, Va., said county government employees don't have to cover long distances to see each other in person.

"Yes. We use it two or three times a day."

— According to Laurie Savage, a telecommunications specialist with the FBI, top managers use the equipment for meetings among four regional agency sites in place of traveling.



"Yes. We have many inspectors in different power plants, and they have to instantly be able to connect with [headquarters]."

— Esther Shoars works as an office manager for the Nuclear Regulatory Commission site at the North Anna Power Plant in Mineral, Va.

"Yes. We have meetings with field offices."

— Franz Zichy, an electrical engineer with the National Weather Service, said the equipment is used about once a month in place of travel by employees at headquarters or in the field.

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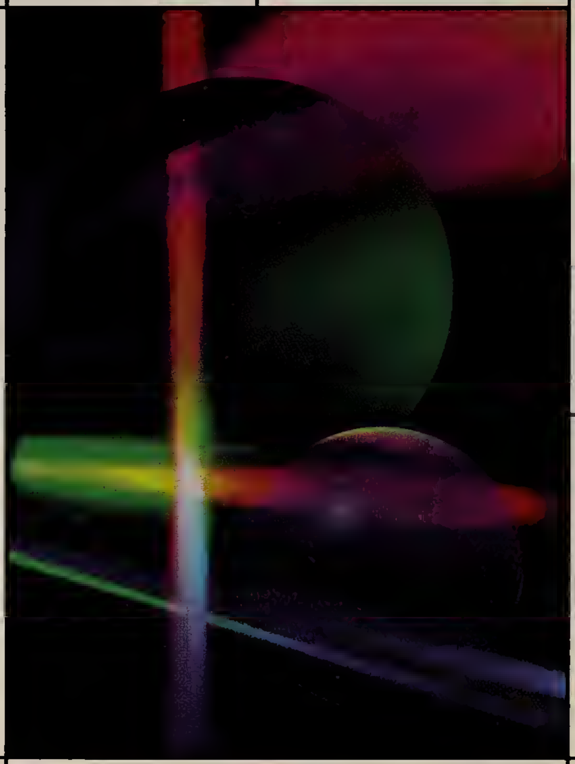

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Briefs

■ **GWI Software, Inc.,** *of Vancouver, Wash., this week will ship a pair of help desk and customer support products for Lotus Development Corp.'s Domino server environment:* **Help for Lotus Notes-Netscape Client** *and* **Help for the Web.**

The first, priced at $5,000 per server, lets Notes users and help desk technicians access service bulletins, trouble tickets and the like through Netscape browsers.

The second product, priced at $9,995, is designed for users that do not have Notes clients.

© GWI: (360) 693-6944.

■ **Computer Systems Advisors, Inc. (CSA),** *in Woodcliff Lake, N.J., this week will unveil* **Silverrun Universal Modeler,** *the first application modeling tool designed specifically for Informix Software, Inc.'s object-relational database, Informix-Universal Server.*

The Windows-based tool lets developers create a diagram of the data and functions in an application. Then the software generates the physical database.

CSA will release the product in July at the annual Informix users' meeting. Pricing will be announced then.

© CSA: (201) 391-6500

■ **Oracle Corp.** *has released Version 1.4W of its Developer 2000 development tool set.*

Existing Developer 2000 applications can be regenerated in 1.4, creating a Java client that is downloaded via the Web to a PC.

The applet then opens a connection to the application, which runs on an application server called a cartridge.

The software is available now for Windows NT, with a Unix version due by fall. Version 1.4 is available for $3,995 or as part of the Oracle Web Developer Suite, which costs $7,995.

© Oracle: (415) 506-7000

Internet applications

Omnis Studio blends ActiveX, Java components

By John Cox
Foster City, Calif.

A struggling tools vendor this week will release a new product that it claims leapfrogs the competition for building component-based Internet applications.

Omnis Studio is a graphical, rapid application development tool set that lets developers combine ActiveX and JavaBeans software components in a single application.

The product's cross-platform code generators allow developers to run the program on Windows or Macintosh computers or within Web browsers.

The tool set was developed by Omnis (formerly Blyth) Software, Inc., based here. Other new Omnis products connect applications with a wide range of networked databases and manage the development process.

Other new Omnis products connect applications with a wide range of networked databases and manage the development process.

Omnis has a fanatically loyal customer base but in recent years has struggled to survive.

"This year, they have to prove . . . they're more than a good technology company," said Peter Kastner, analyst with Aberdeen Group, Inc., a Boston-based market research company.

Omnis Studio is a complete development environment — including editing screens, debuggers, a set of code browsers (viewers) and so on — all written in C++.

Developers drag Java or ActiveX controls into the component editor, along with OLE Custom Controls, Visual Basic Controls, C++ objects and native Omnis components.

Using the viewers, developers can, in effect, open the components to examine and, most importantly, to change their internal workings (called methods, events and properties).

The developer links components using mouse clicks and wizards — helper programs that guide the developer's actions.

The final application is generated in Omnis Script, which blends the Omnis 4GL for relatively large objects with Dot Notation, an Omnis language used to describe and manipulate the internal features of the objects.

The finished application is run via the compact Omnis interpreter, or Virtual Machine, which is deployed on the various client and server computers.

The new tools have received enthusiastic praise from beta testers and analysts.

"The restart [of this company] with Omnis Studio adds wonderful capabilities to merge Java [components] and ActiveX controls to the [already existing,] incredibly powerful code generators and the scripting language," Kastner said.

"This is a serious development tool, and it's very fast to develop software," said Sebastian Ernest, president of Computer Dynamics, a Denton, Texas-based company that develops training and administrative applications for professional trainers.

"I'm totally turned on by it," Ernest said.

One of the product's key strengths, he said, is the way it exploits an integrated Web server.

"I can write an Omnis application that pulls data from your Web server, formats it into HTML, and then make this data available to browsers coming into my [built-in Omnis] Web server," he said. "My Omnis application can talk to anything that supports TCP/IP."

Omnis Studio Data Access Manager is a single tool for accessing and manipulating all leading databases.

Developers can combine several data sources in a single application. Omnis Studio Production Manager is the central repository for objects, with built-in version control and tracking.

All three products are available now.

Studio is priced at $1,599; Data Access Manager costs $1,299 and Production Manager sells for $799. ■

RealityCheck

Product
Omnis Studio

Company
Omnis Software, Inc.
(formerly Blyth Software, Inc.)

The benefits
- ▲ Lets ActiveX controls and JavaBeans interoperate.
- ▲ Companion products add database access and administration components and, for developer teams, version control.

The drawback
- ▼ Vendor has new senior management and is attempting a financial recovery.

The user view
"Omnis Studio gives me control over the methods and properties in ActiveX and JavaBeans components. I can control the relationships between them. I can allow them to talk, and they don't have to know anything about each other."

— Sebastian Ernest, *president of a Denton, Texas, software development company*

Workflow isn't just for programmers anymore

Action Technologies' AutoPilot hailed for simplicity.

By Paul McNamara
Alameda, Calif.

Workflow products will become more popular, experts say, when the middle managers who are most anxious to automate business processes can design and produce these systems with little, if any, help from programmers.

That day may be drawing near, at least based on the buzz generated by a new workflow development tool from Action Technologies, Inc., called AutoPilot, that runs on the company's Metro workflow engine. Available on a free trial basis through May, AutoPilot is Web-based client software that uses a series of point-and-click prompts to allow nontechnical users to assemble and deploy simple workflow applications in as few as 10 minutes, Action claimed.

That is no idle boast, said potential customers and analysts who were among the 200 or so to take Action up on its 10-minute challenge at the AIIM '97 conference last month in New York. AutoPilot is not designed for high-volume production workflow applications but may provide a quick fix for the kinds of automation opportunities that overloaded IT shops often cannot find time to handle.

"You really could develop a useful little applet in 10 minutes," said Ronni Marshak, an

See Workflow, *page 32*

Get more online:
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- ● A workflow tutorial
- ● Overviews of Web-based workflows

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SHARED LOGIC

The travails of being IBM/Lotus

During our interview process for a consulting project, we heard a number of customers express concerns that go to the heart of the perils and opportunities facing IBM and its Lotus Development Corp. company.

Daniel Blum

One senior manager said his department's problems can be summed up in three words: volume, volume and volume. He is rightly skeptical that any general-purpose messaging, groupware and workflow solution can deliver thousands of transactions per second.

Nor does he believe products such as Lotus Notes, Microsoft Corp. Exchange or Novell, Inc. GroupWise have enough management and measurement smarts even for lower volume interdepartmental workflow.

Historically, IBM has done well in delivering high-volume solutions, but has not always done as well at making them accessible to PC users and workgroups.

Since acquiring Lotus, IBM has tried to do this through links to Notes, with add-ons such as MQSeries for Notes and NotesPump.

Another manager wondered why messaging and groupware requirements can't be handled by intranets.

His point was that Notes could be overkill.

There is considerable discussion in the industry as to whether users would be better off with a server — such as Domino, Exchange or GroupWise — that functions as an integrated messaging/groupware suite.

Lotus is, however, modularizing its Domino server to counteract the overkill perception and the increasingly prevalent notion that, for many users, native Simple Mail Transfer Protocol/Multi-purpose Internet Mail Extensions or Internet Message Access Protocol 4 servers cost less to run.

As a further increment, Lotus will offer its Domino Mail to customers that need messaging, integrated calendaring, news groups, real-time chat and Web access.

The final increment is the full Notes client and Domino server, with the ability to develop and use custom applications.

Therefore, users can absorb Notes in bite-size chunks, or as Lotus puts it, "start simple, grow fast."

IBM is also not relying on Notes alone to make high-volume mainframe solutions more accessible. It is fielding e-business connector products such as IBM CICS Internet Gateway, IBM CICS Gateway for Java, IBM MQSeries Internet Gateway, IBM MQSeries Client for Java, IBM IMS Web and IMS Client for Java.

With IBM offerings accessible to all, users won't need to migrate to less scalable solutions just to make them workgroup-accessible.

Blum is a principal at Rapport Communication. He can be reached through dblum@mindspring.com or www.rapport.com. Call (800) 643-4668 for details about Blum's Next-Generation Messaging seminar put on by Network World and Rapport Communication.

Software uses E-mail link to replicate data

By John Cox

Atlanta

New client/server software from Synchrologic, Inc. is trying to solve the complex problem of linking remote laptop-based databases with corporate data servers.

SyncKit includes server and client software that creates a two-way link between remote and corporate databases, passing changes and new data back and forth to ensure the databases have the latest information.

The software runs on Windows 95 and NT workstations. It can work with various client and server databases, such as Sybase, Inc.'s SQL Anywhere or Microsoft Corp.'s Access on laptops, as well as server databases such as Oracle Corp.'s, or Sybase's SQL Server via the Microsoft Open Data-base Connectivity (ODBC) data access interface.

To move data between databases, SyncKit can use a local E-mail system or SyncFTP, the company's version of TCP/IP File Transfer Protocol (FTP). The vendor has added security, encryption and other features to FTP.

Typically, database replication products from database vendors, such as Sybase or Oracle, handle server-to-server copying. SyncKit focuses on client-to-server but requires no additional programming or changes to the applications or databases, according to Bill Jones, vice president of marketing for the Atlanta-based company.

Synchrologic's SyncKit

How SyncKit replicates data between server- and PC-based databases.

① SyncKit PC client logs database changes.

② E-mail system sends changes to server.

③ The server, relying on the Rules Engine, updates server database.

④ The server also passes new corporate data to PC databases.

"If they can pull this off, it's unique," said Jack Gold, program director with META Group, Inc., a Stamford, Conn., technology research company.

"[With SyncKit,] the amount of work needed by MIS to create that [interdatabase] connectivity is minimal: It's just capturing ODBC calls. I haven't seen any other products that do that effectively today," he said.

When a PC or laptop application makes a change to its local database, SyncKit client software records the change in a log file.

The E-mail client picks up the change files and sends them over the network to the SyncKit server software.

A separate SyncKit Session Manager, which also runs on the PC, handles tasks such as compressing and encrypting files and activating the communications manager process.

On the server, the product's brains are in the Synchrologic Rules Engine, an application that tells other server-based SyncKit programs how to handle incoming or outgoing data changes.

Prices for the server software start at $50,000 for Windows NT. Prices for the client start at $200for Windows 95 or NT. Both ship this week. ■

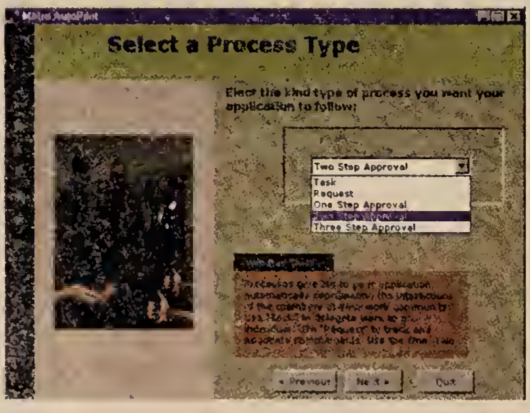
Workflow

Continued from page 31

analyst with Patricia Seybold Group, Inc. in Boston.

"I mean, if you spent an hour on it, you could develop a really stellar application," she said.

Heidi Gutenkunst, information resources coordinator for Electronic Printing Systems, Inc., in Milwaukee, used AutoPilot to fashion a workflow application that would help coordinate the myriad internal and external contributors to her company's customized mailer production operation.



Select a Process Type

Elect the kind type of process you want your application to follow:

Through a series of easy-to-follow prompts *like those pictured, AutoPilot from Action Technologies allows nontechnical users to produce simple workflow applications for routine business processes.*

"It was amazing how easy it was," said Gutenkunst, who has no programming background.

Another trial user, a network manager, was equally impressed with AutoPilot's potential for bypassing IT backlogs.

"I'm looking at that type of tool to help my users handle the jobs they want to get done and not have to wait on IT to get them done," said Vanessa Hickman, manager of end-user support and training for Gaylord Entertainment, Inc. in Nashville.

"I'm looking forward to working with [AutoPilot] to see just how much I can use it for," she said.

Hickman envisions Gaylord's Web site manager using AutoPilot to quickly build an online ticket-ordering application that could stand until her department were able to develop something more sophisticated.

Other quickie applications at the AIIM demonstration included travel approval requests, expense reports and purchase orders.

"There are a number of quite simple processes in companies today that aren't automated because they take programmers using workflow systems to automate," said Action President Terry McGowan.

"The intention is to shift more and more tools out into the hands of the knowledge worker so that they can become more productive," he said.

Steve Weissman, an analyst with Kinetic Information in Waltham, Mass., said he likes the concept, but suspects that AutoPilot may prove to be too much of a good thing if not closely monitored.

"Part of me wonders whether a company would want to let AutoPilot run rampant," Weissman said.

"I have a feeling it falls into the same category as [electronic forms] designed in Excel or Word, or any kind of goofy program that's not an E-forms program," he said.

The prevailing view, however, is that workflow-for-the-masses products such as AutoPilot will produce more benefits than headaches for end users and network managers alike.

"I'm looking at that type of tool to help my users handle the jobs they want to get done and not have to wait on IT to get them done," Hickman said.

"We're getting to software that operates at different levels for different types of users," said Connie Moore, an analyst with Giga Information Group in Cambridge, Mass.

"The whole idea is that a business person should be able to lay out their process, and then someone who can make it more technologically industrial strength could take that and do the APIs and that kind of thing," she said.

Action plans to release AutoPilot this summer at a price that has yet to be determined.

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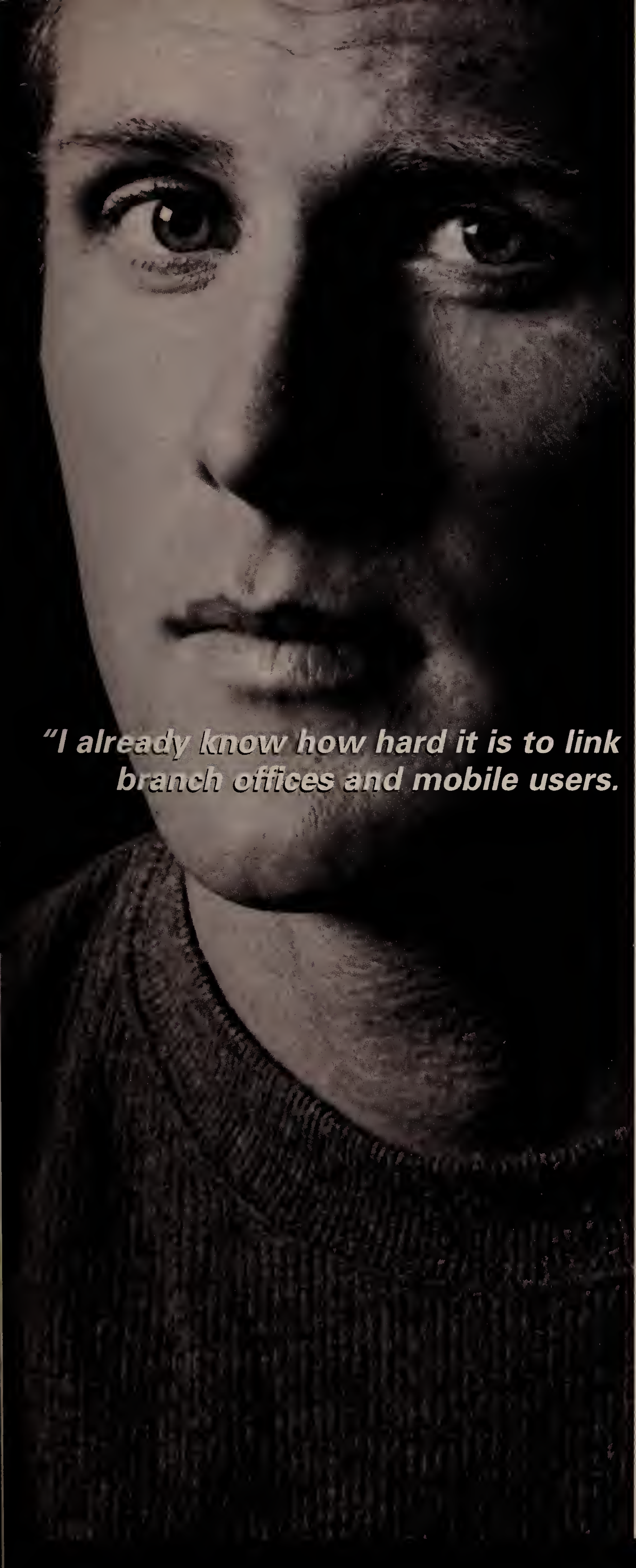

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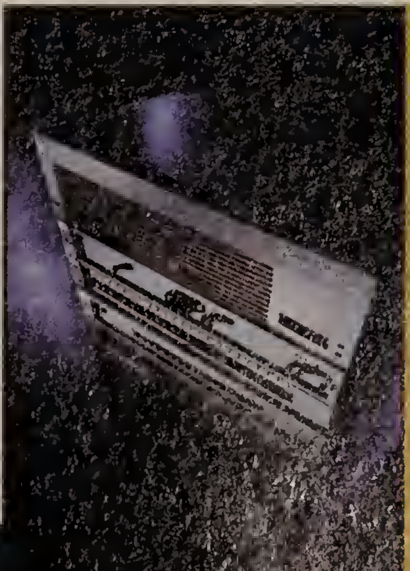

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Intranets & the 'Net

Covering: Internet Technologies and Services
for Collaboration and Electronic Commerce

Briefs

■ **Secure Computing Corp.** *has started shipping SafeWord 4.4 and SafeWord 4.4 for NT, software that adds* **dynamic password** *support to Web-based applications for Netscape Communications Corp. Web servers.*

☎ Secure Computing: (800) 684-4318

■ **Millenium Computer Corp.** *has announced a* **single sign-on** *product, called First-Step, that supports authentication for IBM mainframes, Unisys Corp., Digital Equipment Corp. and Hewlett-Packard Co. host computers, as well as IBM PCs and Macintosh computers. First-Step is sold on a per-site basis.*

User ID: fsdemo

☎ Millenium: (716) 248-0510

■ **Pilot Network Services, Inc.** *has announced a service that* **detects computer viruses** *on inbound or outbound E-mail attachments, File Transfer Protocol and Web files. The service posts continuous antivirus software updates to Pilot's Dynamic Firewall, which uses Trend Micro, Inc. antivirus software when new viruses are identified. Administrators can also be notified of outgoing viruses, to tag those introduced by disks infected by home PCs.*

☎ Pilot: (510) 433-7800

■ **Blockade Systems Corp.** *has started shipping a security product that can extend native security systems installed on MVS platforms to Netscape Communications Corp. Web servers. Called* **Blockade for Netscape,** *the product allows security administrators to define URLs to Resource Access Control Facility to control access to specific Web pages and resources.*

☎ Blockade: (416) 440-1213

In-Site

Intranet saves Siemens a bundle

By Ellen Messmer
Santa Clara, Calif.

It has been about a year since Siemens Business Communications Systems, Inc. installed the intranet it dubbed Route One, and the company is already finding its internal Web to be a profitable road.

The Siemens division, which sells and maintains telecommunications equipment in North America, now publishes corporate information, such as newsletters and its employee benefits handbook, on Web servers instead of paper.

Publishing on the World-Wide Web saves the company hundreds of thousands of dollars a year in printing and distribution costs, said Joe Canas, electronic information services program manager.

"[On weekly newsletters], we save $40,000 per year by eliminating paper," Canas said. By putting its 260-page employee benefits handbook online for the unit's 6,000 employees, "[the company is] saving $150,000 in printing and documentation costs," he said.

Canas estimated it cost $30,000 to put the employee benefits information online.

By publishing electronically, Siemens Business Communications Systems can also keep benefits information up-to-date as insurance or medical practitioner information changes. When the same information was on paper, Siemens had only managed to publish it every two years.

In the Siemens unit's network department, three individuals, including Canas, are responsible for building and maintaining Route One's technical foundation.

Though primarily based on HTML, Route One also includes documents that are downloadable in Standard Generalized Markup Language, Microsoft Corp.'s Word and PowerPoint to employees whose machines are equipped with Web browsers and plug-in software.

A growing number of employees — nearly 100 — spanning marketing, sales, finance and other divisions at 60 locations throughout North America are in charge of generating the intranet's content.

Canas said Siemens still has 1,800 customer service documents stored on IBM systems. Because the networking division did not want to rewrite these in HTML format, it converted an AS/400 to a Web server to do the translation.

Everything from the corporate phone directory to the financial end-of-year reports are going on Route One, leading to concerns about security and accountability.

Route One has spread to approximately one dozen servers nationwide on the Siemens IP-based backbone network, Canas said. "We have an epidemic of server balkanization, and it's hard to stop."

When Route One was first launched and the online documents were intended for all to see, security was not a primary concern.

But now departments want to post more sensitive, proprietary information, putting pressure on the network division to beef up security controls.

"We rely on Windows NT security — user ID and password," Canas said. "We tried to make that the way to get into certain pages."

Siemens is now in the process of refining its security controls to ensure customized views of the intranet. ■

THINGS TO LOOK FOR ON ROUTE ONE

Highlights of the Siemens Business Communications Systems intranet:

- ▶ Used by 6,000 employees in 60 locations in the U.S.
- ▶ Searchable procurement catalog
- ▶ Access to ISO 9000 quality control documentation
- ▶ Marketing presentation materials downloadable in PowerPoint and HTML to customer site
- ▶ Chat-based forums for virtual business meetings
- ▶ Calendar of events
- ▶ Employee handbook and employee benefits document
- ▶ Seven weekly newsletters
- ▶ Some access for trading partners

IP Multicast all over Interop

By Chris Nerney
Las Vegas

Novell, Inc. last week became the last big operating system vendor to make a commitment to IP Multicast. The company announced at NetWorld+Interop 97 that it would support the technology in NetWare 3.1, 4.X and its IntranetWare networking platform.

Novell joins Microsoft Corp., IBM, Sun Microsystems, Inc. and Netscape Communications Corp. in integrating IP Multicast into its operating system.

Novell also announced it had joined the IP Multicast Initiative (IPMI), a multivendor consortium formed last September to campaign for widespread deployment of the technology.

IP Multicast is an IETF standard that sends a single stream of data to multiple recipients. Proponents of IP Multicast said it uses less bandwidth than traditional "unicast," which sends a point-to-point datastream to each user.

Judy Estrin, president of IP Multicast vendor Precept Software, Inc. and one of the founders of the IPMI, said the next big step toward full deployment of IP Multicast is convincing more Internet service providers to offer the service to customers.

Among the other IP Multicast announcements at Interop were:

- Newbridge Networks Corp. announced it now offers server-initiated IP Multicast as part of its VIVID switched routing product. Newbridge officials said the server is ATM-attached, while clients can be attached using existing Ethernet, Fast Ethernet, FDDI or ATM interfaces.
- StarBurst Communications Corp. announced a deal with software vendor Platinum Technology, Inc. that would allow users to automate large-scale software distribution.

Platinum will develop an adapter for its AutoXfer software distribution tool that will enable companies to use StarBurst's multicast file transfer application.

The AutoXfer/Adapter for StarBurst Multicast is expected to ship in the third quarter. Pricing information was not available. Platinum is located in Oakbrook Terrace, Ill.

- Lucent Technologies, Inc. announced it will release a beta version of its file transfer IP Multicast software next month. It will have a graphical user interface.

Currently, a beta version of Lucent's e-cast RMFTP (Reliable Multicast File Transport Protocol), with a command-line interface, is available for Sun Solaris operating system.

Prices for e-cast RMFTP will range from $50 to $200 per client. Lucent is located in Murray Hill, N.J. ■

Get more Info online, including overviews of IP Multicasting.
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NetworkWorld

TECHNICAL SEMINARS

Essentials of Networking *and* Data Communications

Technologies and Their Practical Application

Networks and communications systems are evolving with ever-increasing speed. Network technology options are broad in range, complex in nature and ultimately confusing. Interconnectivity is by no means a trivial issue and interoperability is still difficult to achieve.

Essentials of Networking and Data Communications is a dynamic, fast-paced, plain-English, common-sense and thoroughly understandable explanation of current and developing network technologies and communications systems. Acronyms are decoded, technologies are demystified, standards are put in perspective, and regulatory issues and trends are explained. The present and future "Networked World" is set in the context of meaningful and cost-effective business applications.

12 BENEFITS OF ATTENDING THIS SEMINAR . . .

1. Gain a comprehensive understanding of networking and data communications
2. Understand the fundamentals of transmission systems from analog to digital, from twisted pair through fiber optics and from wired through wireless
3. Gain a thorough understanding of LANs and LAN internetworking technologies, solutions and issues
4. Comprehend the basics of data communications protocols: line set-up, coding schemes, asynchronous vs. synchronous, error detection and correction
5. Understand the evolution of data networking, from DDS and X.25, through T/E-Carrier, ISDN, SMDS, Frame Relay, ATM and B-ISDN
6. Differentiate between bridges, routers, brouters and gateways — what they do and where they fit
7. Learn the nature of current and developing infrastructure technologies, including ADSL, HDSL, SONET, Wireless Local Loop (WLL) and hybrid local loops
8. Understand the differences between circuit, packet, frame and cell switching
9. Develop an informed and meaningful strategy for the transition to Broadband Networking through SMDS, Frame Relay and ATM
10. Compare and contrast the options for wireless data networking in the LAN, MAN and WAN domains
11. Develop a sense of carrier options — LECs, CAPs/AAVs and IXCs — as well as technology alternatives
12. Develop an informed and meaningful strategy for the deployment of emerging technologies, in the context of meaningful business applications

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Developed and directed by Ray Horak, an internationally acclaimed network consultant, author and lecturer, this two-day seminar is informative and entertaining. Interactive case studies are interwoven throughout the day to illustrate the meaningful application of critical technologies presented.

1997 LOCATIONS AND DATES

Philadelphia, PA	Mar. 17–18	**Washington, DC**	Jun. 4-5
Dallas, TX	Mar. 20–21	**Chicago, IL**	Jun. 18-19
San Francisco, CA	May 28-29	**New York, NY**	Jul. 22-23
Boston, MA	Jun. 2-3	**Atlanta, GA**	Aug. 5-6

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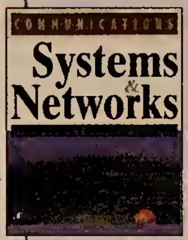

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'NET INSIDER

Oh, say can't you see . . .

A little more than a week ago, a subcommittee of the U.S. House of Representatives' Judiciary Committee unanimously approved the Security and Freedom Through Encryption (SAFE) Act (www.cdt.org/crypto/legis_105/SAFE/hr695_text.html).

This bill would guarantee the right of all "U.S. persons" (citizens, residents or residents in a foreign country "owned or controlled" by a citizen or resident) to use and sell any and all encryption technologies (modulo patent rights and the like, I assume). SAFE would also prohibit any state or federal law from requiring the use of key escrow. In addition, SAFE enables the export of encryption hardware as long as hardware of similar capability is available outside the U.S.

Scott Bradner

The bill permits the export of encryption software if it is "generally available" (for sale to all comers), is of capability similar to that which can already be sold to non-U.S. banks, and is not likely to be diverted for military or terrorist use. In addition, the software cannot be reexported from the foreign country without U.S. approval. Finally, the bill includes harsh penalties for those who use encryption "in the furtherance of a criminal act."

This is a good bill. It defines a future that helps provide a more level playing field for U.S. companies in the world software and hardware markets as opposed to the future defined by the policies of the current administration. The unanimous approval by the subcommittee aside, there is opposition to the bill. The U.S. Department of Justice sent a letter to the subcommittee during its deliberations asking that the bill be rejected.

The letter is more than a bit on the alarmist side: "We believe that the bill would severely compromise law enforcement's ability to protect the American people from the threats posed by terrorists, organized crime, child pornographers, drug cartels, financial predators, hostile foreign intelligence agents and other criminals."

The Justice Department must be used to dealing with rather dumb "hostile foreign intelligence agents" if they're not already using encryption. The Justice Department also seems to have a worldview in which no one outside the U.S. is smart enough to develop good encryption technology.

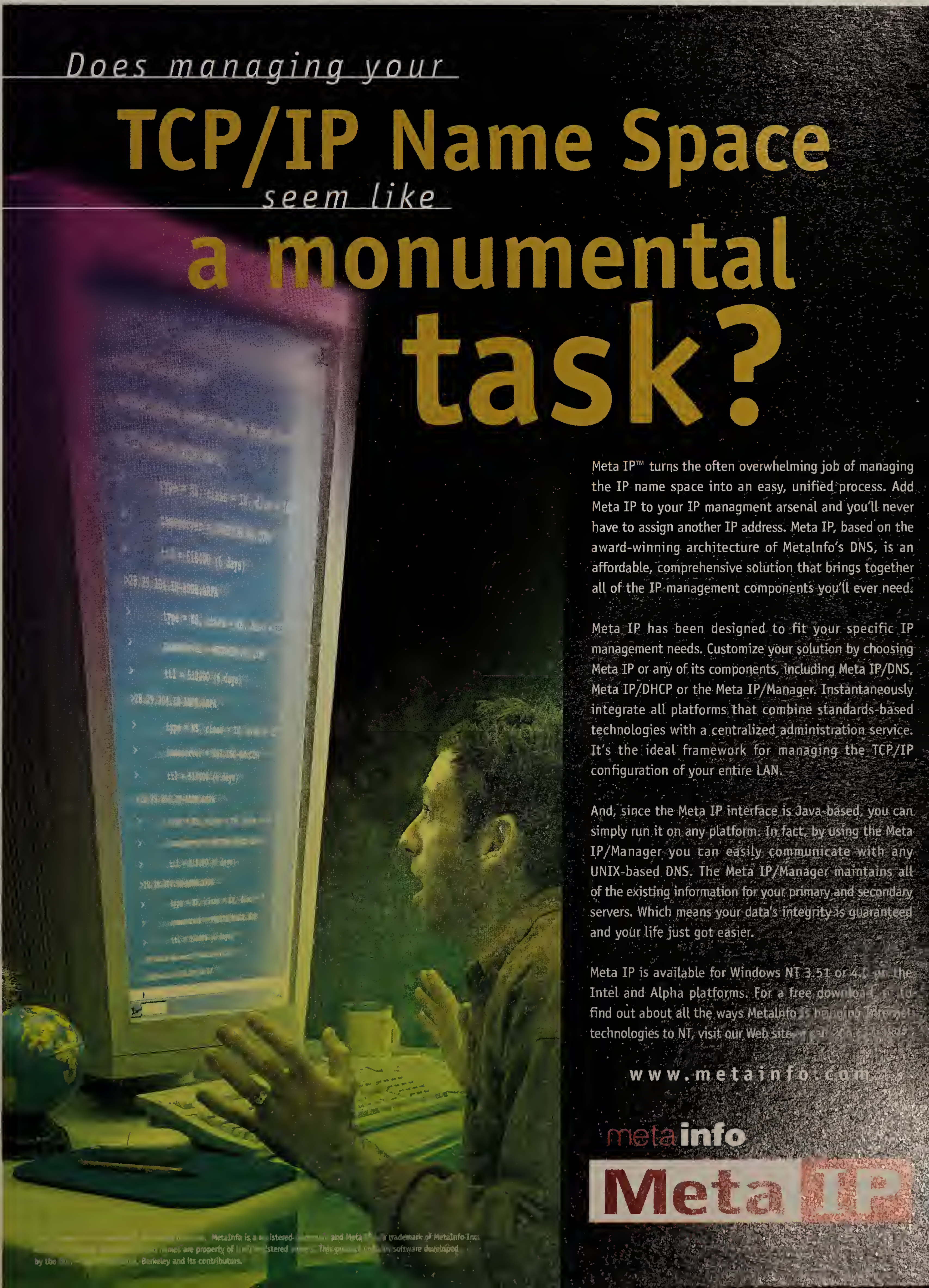
The current administration's worldview has had an effect. Companies such as Microsoft Corp. have not put good encryption technology into their domestic products as a part of the basic operating system.

This does mean that when a computer is seized during a criminal investigation, it is less likely that the files on the machine will be encrypted. Thus, it is more likely that information can be extracted from the disks.

But the current policy has made it very hard for U.S. companies to sell their products outside the country when they compete against products that include good, unencumbered encryption support. The policy has also weakened the security of the Internet. This bill is a step in the right direction.

Disclaimer: Some Harvard professors have been accused of sounding like the output of an encryption program, but the above are my own opinions.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at sob@harvard.edu.



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And, since the Meta IP interface is Java-based, you can simply run it on any platform. In fact, by using the Meta IP/Manager you can easily communicate with any UNIX-based DNS. The Meta IP/Manager maintains all of the existing information for your primary and secondary servers. Which means your data's integrity is guaranteed and your life just got easier.

Meta IP is available for Windows NT 3.51 or 4.0 on the Intel and Alpha platforms. For a free download, or to find out about all the ways MetaInfo is bringing Internet technologies to NT, visit our Web site [illegible]

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NetworkWorld
TECHNICAL SEMINARS

NEXT GENERATION MESSAGING

Capitalizing on Internet & Client/Server E-mail

Presented by Daniel Blum, Rapport Communication

Enterprises across the world are eager to capitalize on Internet and client/server E-mail as a universal infrastructure utility for supporting vital groupware and electronic commerce applications. However, neither monolithic proprietary mail systems nor yesterday's shareware mail packages can successfully support high-volume, mission-critical applications on your Intranet, Extranets, or the Internet at large.

Internet and client/server messaging systems are based on proven yet dynamically evolving standards. Thanks to the wide acceptance of the standards, intense user demand, and strong vendor leadership programs, Internet and client/server mail products are becoming more robust and flexible. Through the smart deployment of messaging products that add value in the areas of standards, security, directory, management, and applications integration, enterprises can build sustained competitive advantage in a cost-effective manner.

Next Generation Messaging will help you decide what services you need from client/server Internet messaging, and what benefits your company can expect from upgrading to the latest standards and technologies. You will learn how, when, and why to deploy products supporting new standards like Multipurpose Internet Mail Extensions (MIME), Internet Message Access Protocol 4 (IMAP4), Extended Simple Mail Transfer Protocol (ESMTP), and the Lightweight Directory Access Protocol (LDAP).

This seminar, taught by Daniel Blum of Rapport Communication, a leading expert in messaging, will also cover best practices for evaluating and selecting messaging products, lowering cost of ownership, migrating from legacy mainframe or LAN E-mail systems to client/server messaging systems, and sending information securely over the Internet. It covers tricky deployment issues, such as how to use mailing lists, message switching backbones, X.500, directory synchronization, and mail monitoring software.

Next Generation Messaging will provide you with the information and insight necessary to more efficiently and effectively implement and manage your messaging infrastructure.

16 BENEFITS OF ATTENDING!

1. Anticipate and profit from key Internet/Intranet next generation messaging trends
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5. Harness the messaging infrastructure for web-based mail and collaborative applications
6. Plan directory integration using LDAP, X.500, and meta-directories
7. Practice "safe messaging" using PGP or S/MIME
8. Assess "do's and don'ts" message-based electronic commerce
9. Analyze vendor product positioning
10. Evaluate Internet service provider (ISP) messaging connectivity or management support for small, mid-sized, and large enterprises
11. Understand and take advantage of different product/service pricing structures
12. Follow best practices for messaging administration, help desk, and management
13. Use proven methodologies for planning strategy, migration, procurement, and deployment
14. Define performance measures and service level expectations to maximize end user satisfaction
15. Master the intricacies of interconnecting standards-based and legacy messaging systems through gateways
16. Time-saving tips and pointers to valuable messaging information resources

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DATES & LOCATIONS

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6/3/97	Irvine, CA	6/24/97	Chicago, IL
6/4/97	San Francisco, CA	6/25/97	Atlanta, GA
6/5/97	Seattle, WA	7/22/97	Philadelphia, PA
6/10/97	Boston, MA	7/23/97	Dallas, TX

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Technology Update

Keeping Up with Network Technologies and Standards

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Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I have tried twice, unsuccessfully, to use Novell, Inc.'s Nprinter graphical user interface (GUI) for Windows 95 Client 32. The last time I tried, I got a message that LPT1 wasn't available on the PC. I messed with the remote and local aspects of the printer definition, but that didn't change my luck. Is there a secret to this that Novell doesn't include in its documentation?

Via Network World Fusion

First, make sure you're not using the beta release of Nprinter. Then determine if there's a problem with the printer configuration in the Windows 95 registry. To do this, delete the port under the System icon in the control panel, turn off the workstation and restart it. Windows 95 should rediscover the port upon start-up.

If this doesn't solve the problem, you'll need to use REGEDIT to edit the port information. Look under the HKEY—LOCAL—MACHINE for a PortName statement, probably in all capital letters. This could be part or all of the problem.

Change PortName so only the "P" in port and "N" in name are capitalized. If you are running one of the OEM-delivered versions of Windows 95, you may not be able to fix the PortName label. You'll have to put the information in the Nprinter.ini file.

Also, make sure you've applied Service Pack 1 if you're using the first revision of Windows 95. Verify that the printer is plugged directly into the computer's LPT port. Some communications may fail if you're using a passthrough device. If the network card in the computer where Nprinter is trying to run is not supported out of the box with Client 32, get the latest driver update.

NPTDRV95.NLM is the workstation module handling the ports for the GUI version of Nprinter for Windows 95. Copying this file from the server or reinstalling the software might eliminate the problem.

The key to high-performance VPNs

For effective virtual private networks, more than just the right protocols are required.

By Richard Kagan

Have you ever tried to connect your business partners and customers using leased lines? No way. You can't justify the cost or expose sensitive corporate data to unnecessary risk.

What about connecting remote sites and employees to the corporate intranet? Dial-in remote access is one alternative. But who wants the added cost and complexity of toll-free access lines, modem pools and remote access servers? The Internet and other public networks offer convenient, ubiquitous and affordable connectivity.

The dynamic nature of the hottest WAN applications — extranets, intranets and remote networks — combined with widely available, low-cost Internet access, are the market drivers behind virtual private networks (VPN). VPNs take advantage of public data networks, such as the Internet, to transport private intracompany and intercompany information.

Many companies already use the Internet to obtain E-mail, maintain a World-Wide Web presence or simply gather information. VPNs allow these companies to use the same public facilities to provide cost-effective remote access, extend intranet services across the WAN and improve communications with business partners and customers through ad hoc extranet links.

Along with offering added flexibility, VPNs enable companies to reduce dependence on leased lines and dedicated dial-in circuits and equipment. VPNs also allow companies to reap big savings on WAN service and administrative costs.

At what price?

A prime consideration when using public networks for private business purposes is securing communications against network intrusion, tampering and fraud. Specifically, it is necessary to ensure that data packets can only be received and understood by the intended recipients (data privacy), that they have not been altered in transit (data integrity) and that they can be verified as originating from a trusted sender (data authenticity) (*NW*, Feb. 24, page 37).

The IP Security Protocol (IPSec) protocols — part of IPv6 reviewed by the Internet Engineering Task Force (IETF) — define encryption, authentication and key management standards for ensuring the privacy, integrity and authenticity of data over public IP networks. Operating at the network layer, IPSec secures all IP data packets independent of the application from which they were created.

But the packet processing methods required to implement IPSec security come at a price. In particular, IPSec adds extension headers to identify encrypted and authenticated IP packets. In many cases, the additional overhead created by the headers can cause a packet to expand beyond the size limit imposed by routed networks.

To compensate for this, routers divide or fragment these bloated packets into multiple legal-size packets — each with its own header. This process, because it increases the total number of packets the network must process, adds to network latency.

The IETF is reviewing a compression methodology for inclusion in the final IPSec standard. VPNet Technologies, Inc., a vendor in San Jose, Calif., is the first company to offer IPSec-compatible VPN solutions that include wire-speed compression.

Using industry-standard algorithms, the technology applies real-time data compression to outbound packets to prevent packet fragmentation. Packets precompressed in this way generally do not grow beyond the legal limits when IPSec headers are added, so they are not subject to packet fragmentation. Moreover, packets containing highly compressible data might actually become significantly smaller when compressed.

The resulting reduction in packet volume and size frees network capacity for the transmission of additional packets. Compression, therefore, effectively increases available bandwidth and network performance by enabling the transmission of packets that are more secure.

The sheer processing intensity of cryptographic data security imposes yet another performance penalty to IPSec and proprietary VPN solutions. For example, performing basic triple Data Encryption Standard (DES) encryption on a packet requires 50 times more computation than normally is required to route an IP packet.

As a result, today's servers and routers are not equipped to provide a high-level of IPSec-based VPN services.

One way to address this encryption issue is to use dedicated hardware for cryptographic processing. Using a dedicated system should result in the ability to transmit VPN data at wire speeds across the WAN, even with triple DES encryption.

VPNs are a natural and necessary response to the major trends evident today in computing and communications.

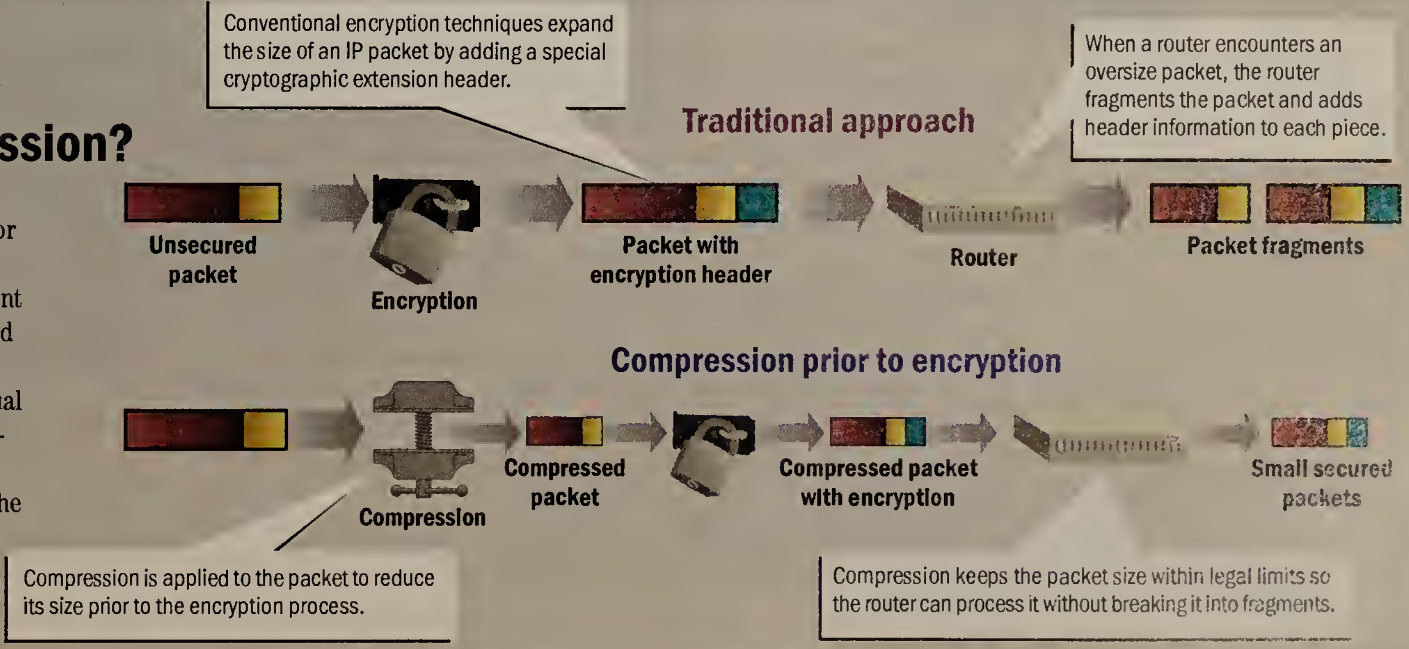
With the right technology, VPNs can deliver data privacy, integrity and authenticity over public facilities without compromising performance, scalability, interoperability, manageability and cost.

Kagan is vice president of marketing at VPNet. He can be reached via the Internet at rskagan@vpnet.com.

UP CLOSE

IPSec compression?

The IETF is reviewing a compression methodology for inclusion in the final IPSec standard. The goal is to prevent packet fragmentation caused by encrypting packets for secure transport across virtual private networks and, therefore, reduce packet volume. Here's a quick look at how the process works with and without compression:



Conventional encryption techniques expand the size of an IP packet by adding a special cryptographic extension header.

When a router encounters an oversize packet, the router fragments the packet and adds header information to each piece.

Compression is applied to the packet to reduce its size prior to the encryption process.

Compression keeps the packet size within legal limits so the router can process it without breaking it into fragments.

EDITORIAL *insights*

The Java hooey patrol

I don't know which I've heard more about lately—Java or Beanie Babies. Both are pretty cool. Beanie Babies make kids smile, and Java makes Bill Gates squirm. But how much do they really matter in the long run?

We all know that kids want Beanie Babies because other kids have them. It's not like Beanie Babies actually do anything. Pretty soon kids will want something new, and those little stuffed animals will be as popular as bell-bottoms and hula hoops.

The same might happen with Java, especially when we get to see these Java-based thin clients, God's gift to computing. Now if I am staring at a lame old 3270 terminal, a thin client looks pretty darn good. But I ain't staring at a 3270. My Compaq's got a CD-ROM, 32M bytes of RAM, Windows 3.1, a big ol' drive and a direct line to the 'Net.

But what really makes me question thin clients is my laptop. This bad boy has pretty much all of the above. Whenever I crank up the laptop the same question comes to mind: Now that we finally have a decent Intel operating system in Windows 95 (after more than a decade of struggle), why would we want to throw it away for something new, unproven, and unstable that creates new dependencies on our still-fragile nets? Especially when you can't take the thin client with you.

Consider this from one of the fathers of Java thin-client computing. When asked by *Upside* magazine how a network computer functions as a laptop, Sun Microsystems, Inc.'s Scott McNealy glibly argued that instead of *working* on a plane, people should do something useful, such as watch a movie or sleep. I've seen the "Pelican Brief," and it was about as useful as barbeque sauce at a vegetarian convention.

And instead of using a laptop when you travel to another office, simply borrow someone else's computer and dial in to your mail server. Now there's a real technological advance.

I've got another bone to pick with Java's write once, run everywhere claims. First, it will only work for lightweight (I am using this as a derogatory term) applications. But I really don't want it to work! How many platforms really matter anyway? OS/2 and Macintosh developers are leaving for Windows in droves, and Unix guys have always been on their own. I think it is better to write a good native application that understands the cool features of my operating system and hardware than build some watered down hunk of junk just so OS/2 users don't feel left out.

I'm no retro grouch, but I have to ask, why is all this change happening and why now? Is it. . .Satan? No. Just hollow marketing hooey. And a desperate desire by the non-Microsoft camp to be relevant.

Doug Barney, news editor dbarney@nww.com

Java Break • Ted M. Young

Users will enjoy playing with Java's new Swing Set

The JavaOne conference in San Francisco last month was certainly exciting: It offered new APIs, new core features, the ability to corner JavaSoft engineers and, of course, free espresso. However, in terms of new technologies, the Java Foundation Classes (JFC) announcement was the most exciting thing to emerge from the show.

JFC isn't really a single technology—it's a framework for a set of related APIs that can be used to create 100% pure Java applications. JFC leverages technologies that Netscape Communications Corp. created for its Internet Foundation Classes product, along with work done by engineers at IBM, Taligent, Inc. (which IBM owns) and Lighthouse Design, Ltd. Sun Microsystems, Inc. purchased Lighthouse last year for its JavaPlan product, a nice two-way modeling and reverse-engineering tool for Java.

With the announcement of JFC, the Java framework wars appear to be over. However, there are still battles to be fought. At the Software Development West show, being held next door to JavaOne in the Moscone Center, Microsoft Corp. issued a prerelease version of its Application Foundation Classes (AFC) for Java.

The AFC was written completely in Java, although Microsoft has not submitted it to be certified as 100% pure Java. The AFC's features are similar to those of the JFC. But because the JFC will become a core Java technology that all Java licensees must support, I'm not sure how Microsoft will position its AFC. Why should developers use the AFC if the JFC is guaranteed to be available on all Java platforms?

The JFC includes the new 2-D API for advanced graphics, text and imaging, the Java Media Framework for multimedia and a so-called "Swing Set" of graphical user interface (GUI) components. The GUI components in the current Java Abstract Windowing Toolkit (AWT) implementation use the underlying operating system to provide the look and feel. This is fine for simple components, such as buttons and scrollbars but is no longer enough to meet the needs of today's GUIs.

The AWT simply never provided a way to extend existing components. As a result, developers were forced to write their own components from scratch. The Swing Set does away with that by providing a set of higher level components, such as tabbed folders and hierarchical expandable lists, as well as an elegant framework for extending these components and building new ones.

Another feature of the Swing Set is what's called a dynamic, pluggable look and feel. This means the look and feel of an application can be changed by anyone—from the developer to the end user—at any time, even while the application is running. In addition, because the developer doesn't have to worry about how the end user interacts with the components, he or she doesn't have to worry about the hardware being used, be it a high-end workstation or a set-top box.

Pluggable look and feel also means that your corporation can define a GUI standard for all Java applications, potentially even those written by others. This will reduce the amount of end-user training required; regardless of the end user's platform, the application will appear the same.

Of course, determining whether this is actually good depends on how much end users like their computers' native GUIs and how willing they are to learn a new one.

It's likely that end users who aren't heavily tied to a platform, such as single-task operators and kiosk or Web-based users, will be affected first.

The JFC is a big win for Java. Freed from having to write low-level code, a developer will be able to concentrate on the application itself, leaving the interface design to someone else. And, most importantly, end users will have applications with the sophisticated GUI they need.

Young is president of Advanced Web Technologies Corp., a Java training, consulting and outsourcing firm in New York. He can be reached at (212) 487-9064 or via the Internet at tyoung@javatrain.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

3Com claims Layer 3 lead

Your article "Bay, 3Com at turning points" (April 28, page 1) uses the views of a misinformed industry analyst to mis represent 3Com Corp.'s current and future Layer 3 switching capabilities. Th article also does readers a disservice by giving so much credence to vendor pro ises about future "wire-speed" switchin solutions and paying virtually no attention to actual facts regarding what is bei delivered today.

As a result, it might appear to reader that 3Com is somehow behind in Layer switching when, in fact, we have led this technology market for several years. It i important to note the following:

The Blue View • Anura Gurugé

Sorting through IBM's gateway options

After vehemently decrying the strategic significance of channel-attached bridge/routers, IBM did a major about-face with its mid-March announcement of an Enterprise Systems Connection (ESCON) channel interface to its new 2216 Multiaccess Router.

Big Blue also announced that a 2216, with its own set of channel interfaces, can be integrated with channel-attached 3746-900 front-end processors currently installed in large SNA networks to realize high-throughput Token Ring and serial connections.

IBM's endorsement of channel-attached multiprotocol bridge/routers is good news for the entire mainframe user community. Many mainframe users are in the throes of finalizing their intranet plans and determining the most effective way to support TCP/IP to and from mainframe-dominated data centers.

MARTIN BRAUN

Full-function bridge/routers supporting various TCP/IP routing schemes, such as Open Shortest Path First, are usually the optimum means for implementing solid TCP/IP gateways to mainframes. This is particularly true if the router can also perform TCP/IP off-load functions, such as checksum calculations, to minimize mainframe CPU cycle usage.

Nevertheless, the channel-attached 2216 will be a source of concern for many network managers — at least in the short term. With its arrival, IBM now offers eight functionally overlapping mainframe gateway solutions of various vintages spanning 14-odd years. Given that IBM has been remiss in providing any categorical positioning among these disparate gateways, there is bound to be a lot of agonizing over how and where the 2216 fits in relative to other solutions.

In addition, the 2216, which was announced last October and only started to ship at the end of March, is unproven. The channel-attachment feature will not be available until mid-July, while the ability to integrate with an existing 3746-900 — with the 3746-900 and 2216 having their own sets of ESCON connection — will not be possible until October. These factors present a major concern, particularly because we are talking about the epitome of mission-critical networking.

Therefore, the 2216 is not going to be seen as a fully tried-and-tested solution for mission-critical applications until late this year. So, for now, the best you can do is pencil it in as a potential solution — if your gateway needs can wait that long.

Much of the 2216's multiprotocol software, excluding the Advanced Peer-to-Peer Networking, High Performance Routing (HPR) and ATM code, is said to be based on software IBM originally acquired from Proteon, Inc. and has been used in its relatively successful 2210 branch office bridge/router. However, IBM's track record with multiprotocol bridge/routers has not been stellar — users of IBM's 6611 router in particular will likely take a wait-and-see approach before they commit to the 2216 as a mainframe gateway.

If and when the channel-attached 2216 proves to be a solid and stable solution, you'll have to decide how it stacks up against IBM's other gateway solutions: the 3172, 3174, Open Systems Adapter-2 (OSA-2) 3745, 3746-900, 3746-950 and 3746-900/2216 combination.

The 3745 and 3174 are very long in the tooth, and even IBM concedes that they are in end-game mode.

The channel-attached 2216 appears to impinge most heavily on the 3172 and the OSA-2. The 3172, which is based on a ruggedized PS/2 chassis, was IBM's first attempt to provide a dedicated, low-cost, LAN-centric mainframe gateway. Though it can now support a 155M bit/sec ATM connection, the 3172 really does not have the throughput or the capacity to act as a gateway for large networks. So while the 2216 is a slightly more expensive solution, it is likely to be a good alternative to the 3172.

The OSA-2, which also now supports ATM, unfortunately is available only on lower end, air-cooled mainframes. The 2216, at least on paper, is a much more versatile, higher capacity solution that will work across the entire spectrum of mainframes. It also should also be considered an alternative to the OSA-2.

If it works as it should, the 3746-900/2216 combination should provide mainframe users with the best of both worlds. The 2216 can handle TCP/IP and HPR, while the 3746-900 can take care of the traditional SNA, including SNA Network Interconnection, high densities of Synchronous Data Link Control connections and Binary Synchronous Communications.

In theory, the 3746-900/2216 combo should make the 3746-950 obsolete. The former provides a superset of functions offered by the 950 and also supports the traditional SNA features set — a feat that the 950 cannot emulate.

IBM's endorsement of channel-attached bridge/routers could not have come at a better time, as more users start moving toward intranets. If the 2216 proves to be a solid solution, it will provide mainframe users with a compelling gateway option for their next-generation networks.

Gurugé is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or via the Internet at aguruge@mcimail.com.

- 3Com is the industry's most experienced high-speed Layer 3 switching vendor. We developed the first Layer 3 switching Application Specific Integrated Circuit (ASIC) in 1993 and have since shipped more solutions for production networks than any other supplier.
- 3Com offers the highest speed Layer 3 switching solution available today: the CoreBuilder 6000, which supports 1 million packets per second.
- 3Com provides Layer 3 switching options to suit diverse customer requirements. For example, our current and future Layer 3 switching solutions provide multiprotocol support and support a breadth of technologies, including Ethernet, Fast Ethernet, FDDI, ATM and soon, Gigabit Ethernet. This year, we will also add cut-through switching — Fast IP — to our suite of leading Layer 3 switching solutions.
- Before the end of the year, 3Com will deliver third-generation Layer 3 switching for multiple 100M/1000M bit/sec technologies.

With our Layer 3 software and ASIC expertise, we are confident these solutions will ship on time, and in some cases, ahead of competitors.

Most of the vendors that the article purports to be early-to-market leaders in next-generation Layer 3 switching have no track record and have not shipped even first-generation Layer 3 switching.

Because experience is critical in areas such as ASIC development and software design, many industry analysts already have voiced skepticism about start-ups' ability to deliver this capability.

In addition, many of the future solutions cited in the article lack support for FDDI, ATM and Gigabit Ethernet, most are not multiprotocol, and several will not scale beyond the capacity promised in their first release.

In essence, many of these early-to-market solutions will not be viable for robust network systems.

When we inquired about these issues, we were told that the information regarding our current Layer 3 capabilities was specifically excluded from the article because we did not claim to offer wire-speed switching solutions today.

However, users will find that many vendors claiming to offer wire-speed Layer 3 switching are actually only doing that — claiming.

Using accepted industry methods, we can demonstrate that most of the so-called wire-speed products mentioned in the article do not support maximum packet rates for all configurations.

Thank you for the opportunity to set the record straight.

Ron Sege
Senior vice president, 3Com Systems
3Com Corp.
Santa Clara, Calif.

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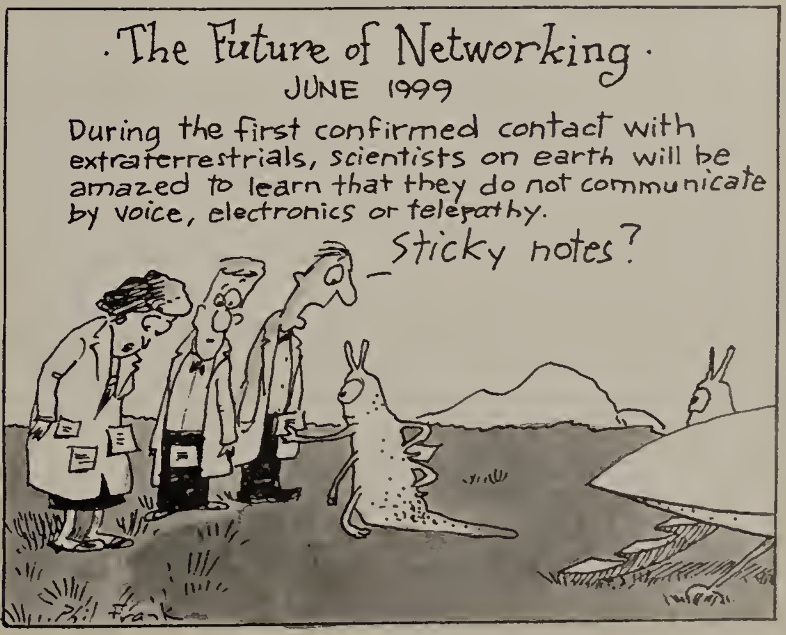
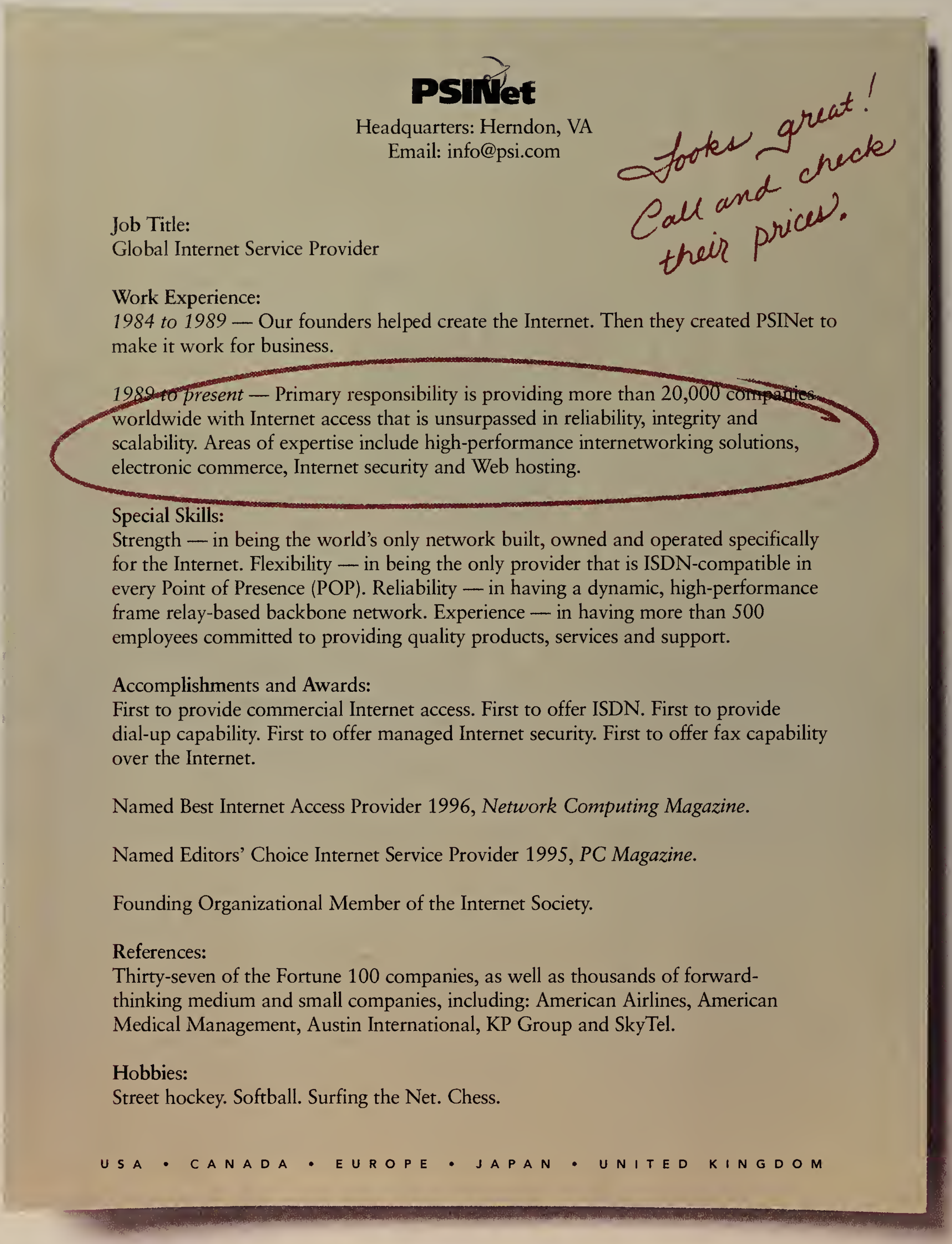

. The Future of Networking .
JUNE 1999
During the first confirmed contact with extraterrestrials, scientists on earth will be amazed to learn that they do not communicate by voice, electronics or telepathy.
Sticky notes?
Phil Frank

Phil Frank and Joe Troise baba@sfgate.com

Almost every Internet provider has experience. Unfortunately, it's not on the Internet.



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Accomplishments and Awards:
First to provide commercial Internet access. First to offer ISDN. First to provide dial-up capability. First to offer managed Internet security. First to offer fax capability over the Internet.

Named Best Internet Access Provider 1996, *Network Computing Magazine.*

Named Editors' Choice Internet Service Provider 1995, *PC Magazine.*

Founding Organizational Member of the Internet Society.

References:
Thirty-seven of the Fortune 100 companies, as well as thousands of forward-thinking medium and small companies, including: American Airlines, American Medical Management, Austin International, KP Group and SkyTel.

Hobbies:
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NetworkWorld
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TICKER

Managed frame relay offerings come from all corners

Ticker also marks a few firsts: Frame relay prioritization, ATM SVCs and xDSL services.

By Tom Jenkins and Jeff Phillips

The *Network World* Broadband Ticker summarizes the most important broadband-related events each quarter. We put each announcement in perspective and give you the upshot on who, if anyone, benefits.

Managed frame relay service is the hot area for this quarter, with a number of carriers introducing offerings that add to the many already available. Managed services place the service provider in the role of managing the WAN, allowing you to focus on managing the LAN or other more strategic endeavors.

But because the services are relatively new, there are some issues.

First, most providers support only one or two customer premises equipment (CPE) vendors, limiting your choices. Also, pricing information is generally difficult to get and even more difficult to understand. Third, you need to understand how your network will be managed, who is responsible for each component and what credits or benefits you receive if certain service levels are not achieved.

Frame Relay

EVENT: AT&T announced Managed Network Solutions, a fully managed frame relay service you can order with frame relay access devices (FRAD) or routers. Under the AT&T Managed Router Solution, you can choose Cisco Systems, Inc., Bay Networks, Inc. or 3Com Corp. equipment. The AT&T Managed FRAD Solution provides support for Motorola, Inc. FRADs and customers with SNA and LAN traffic. AT&T will perform all network design, installation, monitoring and ongoing maintenance, depending on your needs.

UPSHOT: This service provides a single point of contact for problems with CPE, access and transport, helping you resolve problems more quickly. AT&T's robust solution is among the top managed service offerings available, along with those from Sprint Corp. and US WEST, Inc. The Managed Router Solution Express option, for example, comes with the services, protocol support and equipment most often used in midsize nets (no more than 50 sites) along with a service guarantee.

EVENT: WorldCom, Inc. announced the general availability of an NxDS-1 high-speed frame relay service that offers connections as fast as 12M bit/sec provided via inverse muxes from Larscom, Inc.

UPSHOT: WorldCom and MCI Communications Corp. are the only major carriers with NxDS-1 frame relay access offerings. For high-speed access to a frame relay network, NxDS-1 can be more economical than multiple DS-1 ports or a single DS-3 access line. In addition, NxDS-1 access can be ordered via diverse routes to protect against local access failures.

EVENT: US WEST !nterprise announced Managed Data Services (MDS) within its region, with national availability to come. !nterprise's first managed frame relay service lets customers choose which aspects of network management they want US WEST to perform and which, if any, they want to perform in-house. Only Cisco routers are supported, and customers must be using IP. Pricing varies, based on the number of LAN and WAN ports, from $275 to $999 per month per router exclusive of maintenance.

UPSHOT: Unlike most services, which to varying degrees try to pigeonhole you into selecting groups of options, MDS is truly a la carte — a big plus if you want to do some chores yourself and farm out tasks such as installation to a third party. !nterprise has also been more forthcoming than most carriers about future equipment support plans. Bay routers will be supported in the second quarter and 3Com's in the third, while LAN switch and hub support will be offered in the fourth quarter, along with a managed private-line service.

EVENT: MCI introduced the first commercially available permanent virtual circuit prioritization service, MCI Priority PVC. You can order PVCs at one of three levels: low, medium or high. During periods of network congestion, data will be sent over high-priority PVCs at four times the rate of a low-priority PVC configured for the same committed information rate (CIR). The medium-priority PVC runs at two times the low-priority rate. There are additional charges for PVC prioritization, but they are not public at this time.

UPSHOT: This is the first PVC prioritization service, although most carriers have plans to implement prioritization options this year. Prioritization is most effective when CPE and the carrier's network equipment work together. Customers have always been able to prioritize their own traffic, but the corresponding network prioritization has not been available. The service is especially useful to customers transmitting delay-sensitive traffic such as SNA and voice. But be aware, you are only prioritizing your own traffic — you're not getting preference over other users. Still, if you have multiprotocol traffic that is delay-sensitive, you should consider the Priority PVC service.

NETWORK WORLD BROADBAND TICKER ROUNDUP

What's new	Who's announcing	Who's been there
Frame Relay		
NxDS-1	WorldCom	MCI
Pricing changes	AT&T, MCI	Many carriers over the past year
Managed service – changes to or introduction of	AT&T, US WEST !nterprise, Cable & Wireless, Intermedia	Most carriers have managed services to some degree
PVC Prioritization	MCI	Nobody – this is a first
DS-3 access	Ameritech	US WEST !nterprise, Bell Atlantic, GTE, BellSouth
ATM		
SVCs	AT&T	Nobody – this is a first
Granularity in bandwidth	US WEST !nterprise	Varies widely. AT&T, MCI and Sprint say they support Nx64 ATM PVCs, but only AT&T has it tariffed
Public pricing	AT&T	Not applicable
General events		
xDSL service announced	US WEST !nterprise	Nobody – this is a first

EVENT: MCI last week announced a frame relay price change. MCI increased its port access fees and monthly maximum usage fees but reduced monthly minimum fees to $5 for all PVC speeds.

UPSHOT: MCI is positioning this as a price decrease, but that depends on your usage pattern (see graphic, page 45). If you're at or near minimum MCI usage levels, you likely will save money. But those near the maximum levels will be hit with the increased port access fee and the increased maximum rate — no bargain. On the other hand, the $5 minimum PVC rate will make it more economical to build a fully meshed network with additional redundant data paths.

EVENT: Ameritech Corp. has filed a DS-3-access-to-frame relay tariff that was scheduled to take effect in April. The tariff offers PVC speeds between 1.536M and 20M bit/sec. The service will be CIR-, port- and mileage-sensitive.

UPSHOT: Because of increases in the size of most frame relay networks, customers are demanding high-speed access. High-speed frame relay can be more economical than private lines for some customers. Ameritech is among the first local exchange carriers (LEC) to tariff DS-3 access to frame relay. Others have special contract DS-3s, but Ameritech's is a standard offering that can be ordered by any commercial customer.

EVENT: Cable & Wireless, Inc. announced its IP FRAD offering. An enhancement to the carrier's SNA FRAD service, this is a fully managed service targeted at customers running IP and SNA traffic. Cable & Wireless is responsible for monitoring and maintaining the FRAD, access and transport.

UPSHOT: This service can be an easy-to-implement option if you're running IP and SNA traffic, but it has limitations. The service is only available to sites within the U.S., and it supports only Motorola equipment.

EVENT: Intermedia Communications, Inc. entered the managed router market this quarter. The most notable aspect of its service is Intermedia's support for routers from Cisco, Bay, ADC Kentrox, Motorola, Adtran, Inc. and 3Com. In addition, Intermedia's service guarantees cover transport, access and CPE all the way to the LAN port.

UPSHOT: Intermedia offers the most CPE options of any carrier, giving you the ability to select the vendor that most closely matches your network requirements. If you have a number of different brands of CPE or simply want flexibility and choices, this service has the best chance of supporting your needs. Intermedia also has one of the most aggressive service guarantees on its frame relay service, and this has been extended to include the managed router service. But still missing from Intermedia's, and all other carriers', managed solutions is support for voice FRADs. If you are running voice over your frame relay network, you still must manage and monitor your own network.

EVENT: In March, LCI International, Inc. made available a service called COMPEER frame relay, a wholesale version of its frame relay service targeted at switchless resellers. Other regional carriers currently have wholesale products, and major national carriers are planning to offer wholesale services late this year.

UPSHOT: As basic frame relay services become more of a commodity, the wholesale market for frame relay is likely to grow rapidly, and use of alternative distribution channels will become more prevalent, just as they did in the voice market. This means two things for end users. First, be sure you know where you are getting your service. Just because you order service from Carrier A doesn't mean it is the underlying carrier. Second, because there will be more people selling frame relay service, prices will likely drop. There will still be carriers that offer value-added services that may or may not be available immediately from a wholesale provider.

ATM

EVENT: AT&T announced it is now offering ATM switched virtual circuits (SVC). Pricing is based on class of service, call duration and connection speed associated with each call. SVCs can be used for point-to-point and point-to-multipoint connections at access port speeds of T-1 and T-3.

UPSHOT: AT&T is the first interexchange carrier (IXC) to offer SVCs, which give you benefits such as on-the-fly connectivity between sites, efficient use of bandwidth, increased flexibility, and in some cases, less expensive monthly charges. Most other carriers say they plan to offer ATM SVCs before year-end and frame relay SVCs late this year or in early 1998.

MCI FRAME RELAY PRICE CHANGE: FEAST OR FAMINE?

A hypothetical case study outlining changes in monthly fees.

Minimum usage:	**Today**	**Future (estimated)**
1.024M bit/sec port	$1,500	$1,575
768K bit/sec PVC	$230	$5
Total	$1,730	$1,580
Savings		**$150**
Maximum usage:		
1.024M bit/sec port	$1,500	$1,575
768K bit/sec PVC	$700	$735
Total	$2,200	$2,310
Additional cost		**$110**

SOURCE: TELECHOICE, VERONA, N.J.

EVENT: US WEST !nterprise announced more granularity in bandwidth increments of its ATM PVCs. PVCs can now be ordered in 64K increments from 64K to 1.349M bit/sec. Prior to this change, customers were limited to a minimum of 1M bit/sec increments. This service is available only in-region at this time.

UPSHOT: This change, the result of market pressure and feedback from existing customers, allows you to more closely match your PVC speeds to actual traffic patterns.

EVENT: AT&T became the first IXC to publish ATM rates.

UPSHOT: This lets you easily evaluate the economics of ATM and will likely lead to other carriers tariffing rates in the next quarter or two. Overall, the more standardized the services become, the more it helps ATM become more legitimized and appear more mainstream. This, in turn, should help it gain greater deployment as a commercial service instead of merely as a carrier backbone transport technology. If you've been putting off evaluating ATM economics, this should help you get started.

General events

EVENT: AT&T increased its private-line, frame relay and ATM rates. After lowering its frame relay service rates by 7% just last quarter, the carrier increased private-line rates this quarter 5% to 15%, raised frame rates by 5% and ATM rates by 15%. AT&T says the increase was necessary to pay for infrastructure improvements. Access connection and coordination were not affected.

UPSHOT: If you are considering implementing AT&T's frame relay service, and price is a major factor in your decision, you may want to think again. And given that other carriers may follow in AT&T's footsteps, you may want to lock in lower rates now or wait until prices drop again, probably within the year.

NetworkWorld Fusion FIND IT ON FUSION 1928

Go online for the past year's worth of Broadband Tickers. Link to sites that can help you bone up on frame relay and ATM technologies.

EVENT: US WEST !nterprise introduced the first digital subscriber line service in the U.S., dubbed !nterprise DSL. ISDN DSL (IDSL) and high-bit-rate DSL Internet access and remote LAN connectivity services have been made commercially available in four cities and will be available in 14 cities in the region by year-end. The services provide customers with connectivity to the Internet or a corporate LAN at speeds between 128K and 704K bit/sec, with rates ranging from $75 to $175 per month.

UPSHOT: One of the major strengths of the !nterprise DSL service is that it's a fully managed offering with all xDSL terminal adapters included, which means you avoid equipment compatibility and installation issues. Judging from !nterprise pricing, you can expect to get two to 10 times the bandwidth you're getting with a 64K bit/sec line at equal or lower rates. Every other LEC is currently conducting DSL trials and has plans to introduce xDSL services this year.

Looking ahead

In the next six to eight months, it's likely that the number of providers offering ATM SVCs will increase to three. Virtually every carrier has stated that it will offer ATM SVCs in late 1997 or 1998 — expect two or three to actually pull it off. It is even possible that SVCs will be made available for frame relay during that time. It's tough to say exactly which carriers will come through, but a good bet would be AT&T because it was first with ATM SVCs. A lot depends on the equipment providers and on when more SVC-enabled CPE becomes available.

Expect long-distance service level guarantees to be made less restrictive as companies use them as service differentiators. Also look for Web-based access to network management information to become more available.

The broadband services market is changing very quickly. Many small to midsize customers want assistance in installing, monitoring and managing their networks. The remainder of 1997 will see more carriers offering more CPE options and probably support for voice FRADs.

You will also see one or two more LECs enter the national data services market. Although initially they won't be a major threat to the existing IXCs, the LECs will start to increase competitive pressures.

Jenkins and Phillips are broadband consultants with TeleChoice, Inc., a Verona, N.J.-based telecommunications consulting company. They can be reached at tjenkins@telechoice.com and jphillips@telechoice.com.

ATM available bit rate: Second thoughts

By Cathy Gadecki

After much debate and the subsequent approval of the ATM available bit rate (ABR) specifications last spring, many equipment vendors and carriers are now questioning its true value.

The high cost of implementing complex ABR algorithms has drastically slowed their adoption by ATM equipment vendors and carriers. Futhermore, many are now questioning how well the schemes will work in boosting bandwidth efficiency.

The ABR specifications leave many technical aspects open to vendor implementation, such as the algorithm for calculating the explicit traffic rate value. That is the rate at which users are permitted to send traffic into the network, and it changes depending on network load. This raises questions as to how well ABR schemes, intended to shorten long control loops, will work across multiple vendor platforms.

"Most [customer premises equipment vendors] will have difficulty adding the costly and complex scheme, along with all the other specifications coming from the Forum, including [LAN Emulation] and [Multi-Protocol over ATM]," says Gary Lee, director of ATM Marketing at General DataComm, Inc. Indeed, few CPE vendors have unveiled plans to support ABR near or long term.

In the absence of ABR, many carriers are now focusing on unspecified bit rate (UBR) service packages to make ATM more cost-effective for bursty LAN-to-LAN and Internet traffic. UBR implementations have matured to offer throughput almost as high as that expected from the complex ABR schemes. Advanced capabilities boosting performance include very large buffers, early and partial packet discard, queuing on a per-virtual-circuit basis and fair-weighted queuing. Cascade Communications Corp. has even gone a step further by reserving a minimum throughput rate for UBR connections in the bandwidth management algorithm of its switches.

If you need to support bursty, nonreal-time traffic across an ATM network, talk to your ATM service provider about its ABR service packaging, performance and guarantees. But be aware that UBR may be the underlying technology behind LAN or Internet transport offerings, even if the term "UBR" isn't in the service name.

Gadecki is senior broadband consultant at TeleChoice, Inc., a consultancy in Verona, N.J.

Falling in love with Fusion

NetObjects' Web site development tool will capture the hearts of Webmasters.

By Lee Schlesinger

I liked Microsoft Corp.'s FrontPage, but I love NetObjects, Inc.'s Fusion.

FrontPage made me feel like I had a capable tool for Web site creation. Fusion makes me feel like I can do anything.

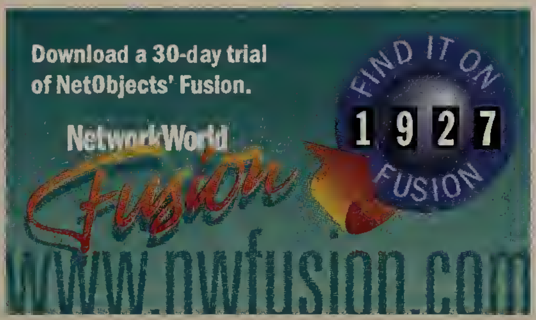
Well, almost anything. This Web site development and management application isn't suited for sites that require interactive database access or electronic commerce applications. But if you want a tool that enables you to quickly create and modify sites, even change a variety of looks with just a click or two, I've seen nothing that beats NetObjects' Fusion. While its features are overkill for the casual user who manages only a handful of pages on a single Web site, Fusion will quickly become indispensable for real Webmasters.

With Fusion, you begin by designating a site template, which specifies the kinds of pages and the location of elements on each page. You can also import an existing site. If you choose to import, you must decide whether to bring the files in to Fusion, thereby changing their layout, or keep track of them as external HTML files. You can edit external HTML files from within Fusion by specifying any HTML editor in the Preferences menu.

Each page's appearance is controlled by what NetObjects calls "styles," which define the look of banners, buttons, backgrounds and text (see Figure 1). Dozens of supplied styles can give your site a look that ranges from button-down to whimsical to avant-garde. And if you don't find exactly what you want, creating your own style is simple.

Each page in a site comes with elements that tell you how to modify them (see Figure 2). For example, a Jobs page for a corporate site comes with an employment overview, a list of open positions and instructions for submitting a resume. You simply change the supplied text to suit your needs. You can also move sections around to suit your aesthetic sensibilities.

Fusion has tools for adding tables, forms, multimedia, Java or ActiveX to your pages. There's even a built-in spell checker. If you want to present data from an external database, you can easily create a data list with elements from any Open Database Connectivity database, although no tools allow you to update the database files. You can, however, use a short data list as a table of contents that points to more detailed information on a given item.


Download a 30-day trial of NetObjects' Fusion.
NetworkWorld Fusion
FIND IT ON FUSION 1927

Fusion can use variables to customize pages. You can specify a variable in multiple page layouts and change their appearance all at once by editing the value in a single place. For example, you could specify a corporate division in a variable name and use the same design for multiple divisions. Fusion produces straight HTML code, unlike Microsoft's WebBots, which require proprietary extensions on the Web server.

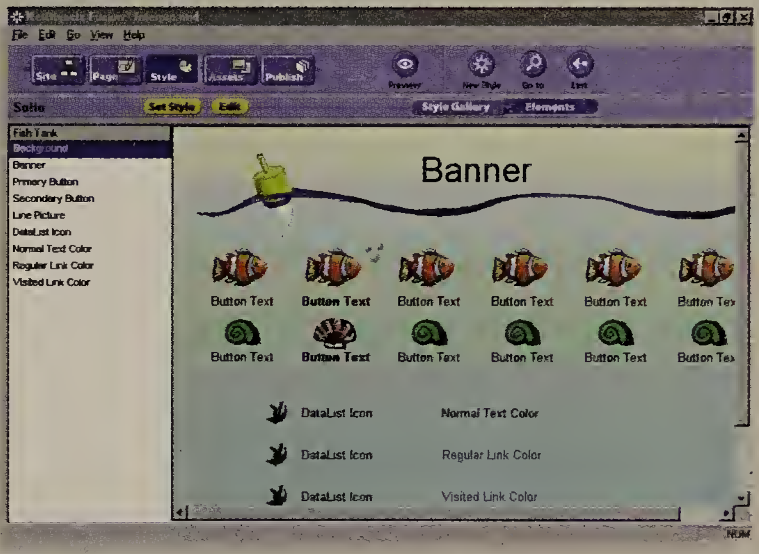
A site management view lets you see your entire site hierarchy, down as many levels as you specify. Fusion also can automatically publish your site locally or remotely and will ship it to a staging area first so you can try navigating through it before releasing it to the world. During the publishing process, Fusion can generate HTML comments that outline where various parts of each page start and end in the code and create a site map.

Fusion's user interface is eminently logical. I tried working with it before I read the manuals, which consist of a thin "Getting Started" book and a slightly thicker "User Guide." I got the hang of things in no time by clicking on different buttons and menus. For a more comprehensive resource, you can turn to *Web Designer's Guide to NetObjects Fusion 2* (Hayden, $39.99, www.mcp.com) or *NetObjects Fusion 2* (Sams.net, $39.99, www.mcp.com).

Page design is near-WYSIWYG, and Fusion lets you preview in Netscape Communications Corp.'s Navigator or Internet Explorer with a single click.

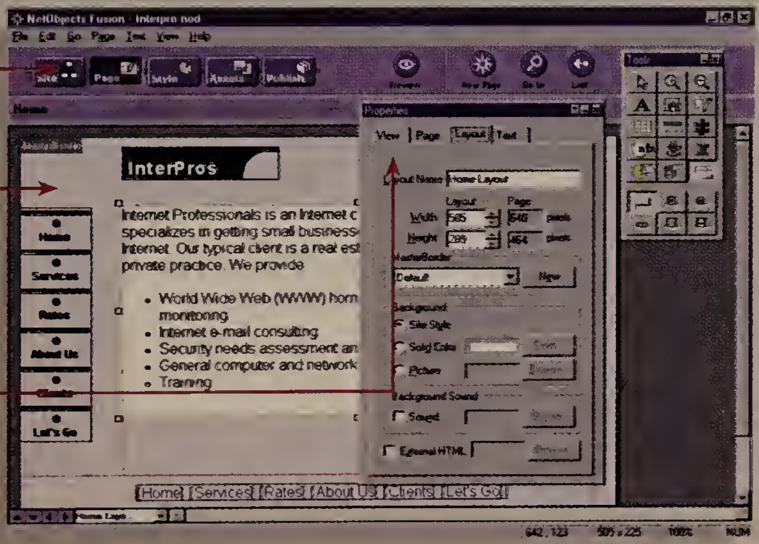
It would be nice if NetObjects didn't feel compelled to put its company logo at the bottom of some pages or if it let you put your own logo there. But I should not quibble — for $695, NetObjects Fusion is the best Web development tool I've worked with to date. ■

FIGURE 1: STYLES EASE SITE DESIGN



Fusion comes bundled with dozens of styles, which define the appearance of backgrounds, banners, buttons and links. A Style Gallery, which catalogs the sets of elements, lets you change the look of a site with just a few clicks.

FIGURE 2: SIMPLE PAGE DESIGN, POWERFUL TOOLS


Navigation buttons walk you through the entire site creation process.

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Product	**NetObjects Fusion 2.0**
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Pros	▲ Profusion of site templates and styles ▲ Variables make customization easy ▲ Page design tool supports forms, ActiveX and Java
Cons	▼ Lacks two-way interactive database support

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Network World Technical Seminars *will launch a seminar later this month. Next-Generation Messaging: Capitalizing on Internet and Client/Server E-mail will be held in New York, May 29; Irvine, Calif., June 3; San Francisco, June 4; Seattle, June 5; Boston, June 10; Washington, D.C., June 11; Chicago, June 24; Atlanta, June 25; Philadelphia, July 22 and Dallas, July 23. Consultant Dan Blum will provide information to help you choose and deploy messaging products, taking into consideration standards, security, directories, management and applications integration.*

The seminar costs $450.

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Indecision is a project killer, but you can beat the beast

By Hubbert Smith

Some project teams have the uncanny ability to make decisions quickly and move on. Others tend to get hung up on even the simplest of matters, grinding the decision-making process — and the project — to a halt.

If your team tends to fall into the latter camp, it's up to you to detect when indecision occurs. You may be faced with team members unfamiliar with the concept of reaching a joint decision. Maybe they are unable to get past the discussion stage to the point of settling on a course of action. Regardless, there are ways to fix the problem and get your team off the dime.

One of the most basic ways is identifying the dozens of decisions that need to be made along the way and who should make them. Try the following steps when you uncover indecision in your projects:

- Identify the issue that requires a decision. Often there's so much swirling discussion about an issue that a team loses sight of exactly what needs to be decided. If complex problems are disassembled into many smaller ones, they lend themselves to faster decisions. The entire team or select members can help dissect the issue. If the resulting smaller problems are still too complex, disassemble them again. Remember, a problem clearly stated is already 90% solved. So at this stage, stay focused on identifying the decisions, the criteria for decision-making and assigning decisions to the right person or group.
- Push decisions to a single point of authority. Wherever possible, allow the most qualified, accountable person to spearhead a decision-making process.

That person should get team input but would make the final decision. This structure reduces the chances for never-ending debates.

Of course, some decisions require a team effort because they affect everyone. In making these decisions, everyone has input, but no one has a veto. It is up to you as project manager to oversee a team decision-making process.

A decision agenda

Once you identify the need for a team-level decision, gather the group to hash things out.

A decision-focused meeting agenda can help you avoid swirling discussions or, worse, stony silence. The agenda should include time for problem definition, brainstorming, clarification and voting.

A meeting technique called round-robin enables everyone to contribute. The leader goes around the table in order, calling on each person one at a time, soliciting brief input on the problem. That input is recorded on a flip chart or whiteboard.

If someone starts pontificating, ask the person to restate his point briefly enough so it can be written down. If a person can't come up with any input, let that person pass. Ask those with several ideas to hold extras for subsequent turns. Round-robin can be used for just about anything: problem definition, solutions, even voting.

After several rounds, it will become apparent that the creative juices are drying up and it's time to decide. At this point, make sure various options are listed where people can see them, then ask for a vote.

Once the vote is taken, it's good practice to ask each individual if he or she can support what the team has decided.

Usually, dissenters who get outvoted for reasons that have been aired will get behind the decision. Sometimes, though, individual disagreement still exists, and you'll have to contend with it should it become a problem.

One way to do that is record what the team resolves in a public plan of record. Posting a decision where everyone can see or access it will head off a repeat debate on the same issue from those looking for a reversal. Essentially, the posting tells team members that if there is no new information, the decision won't be revisited. Remember, if decisions don't get recorded, it's as if they never existed.

Identifying problems early enough to correct them is a fundamental management skill. If you can exercise that skill by reviewing the number of smaller decisions made as part of a project, you'll quickly know when there's a hang-up.

Over the long term, the pace of decision making can be improved proactively with a better process, and reactively, by identifying decision impediments.

This gets you closer to the project consistency that your upper management no doubt views as critical to project success.

Smith is a project manager at a large computer company. He can be reached at hubbert@geocities.com.

www.nwfusion.com

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There's lots of project management software available to help you keep things on track. The Project Management Institute has a comprehensive list of products as well as other project management resources.

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CONFERENCE PLANNING

CONFERENCE: 1997 ICA SuperConference
WHEN: June 1-5
WHERE: New Orleans
SPONSOR: International Communications Association
CONTACT: (972) 620-7020, Ext. 138

Organizers of this conference tout its practicality and "use it the next day" information. Telecom and IS managers can attend single-day miniconferences on intranets, network management and call centers. Tutorials will cover topics such as security, bandwidth delivery, Synchronous Optical Network (SONET), outsourcing and ATM. Conference sessions will focus on benchmarking, telecommuting, year 2000 changeover issues, Lotus Development Corp.'s Notes and the Internet, disaster planning in a client/server environment and electronic commerce.

The full conference, including miniconferences and tutorials, costs $1,175 for ICA members and $1,395 for nonmembers. The conference costs $700 for ICA members and $900 for nonmembers.

CONFERENCE: ATM Year '97
WHEN: June 23-27
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SPONSOR: Technology Transfer Institute
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The complete conference, including two tutorials, costs $1,695. The conference costs $1,195, and one tutorial costs $595.

Go online for more info on these conferences.

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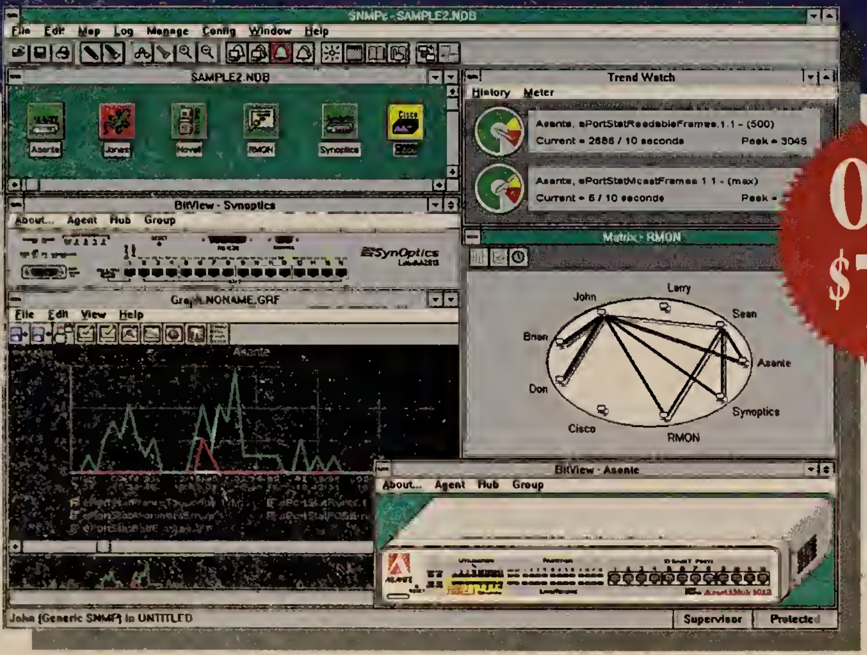

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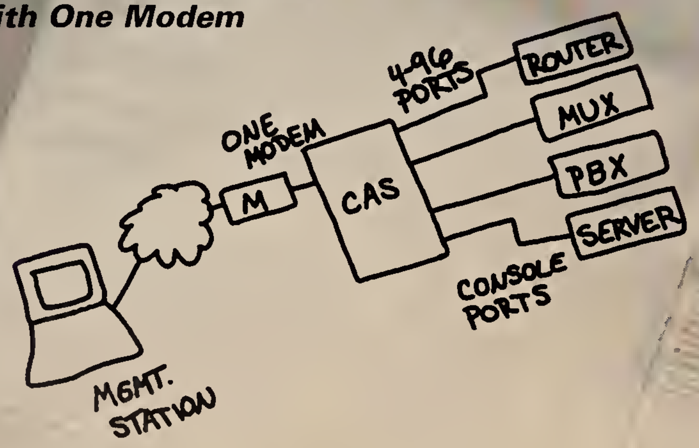

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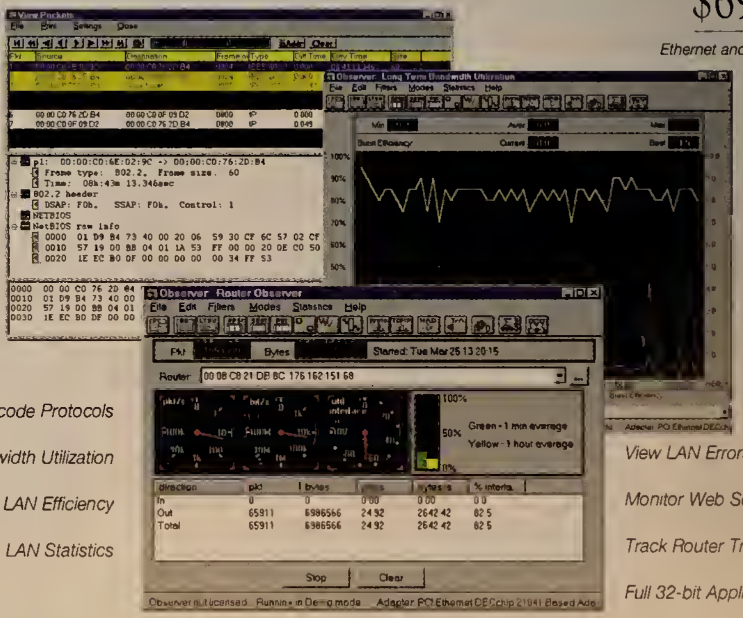

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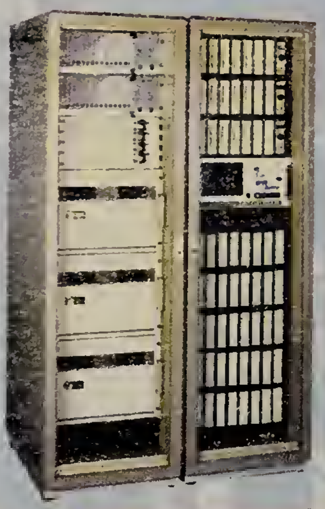

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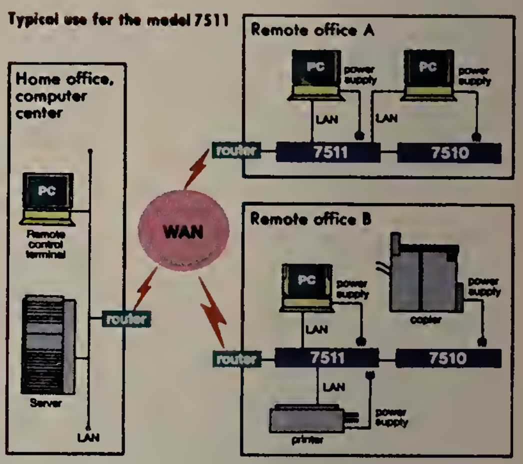

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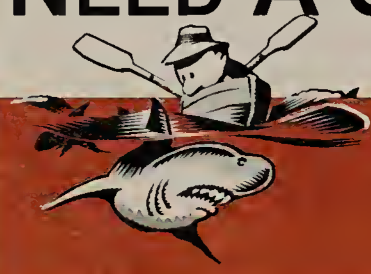

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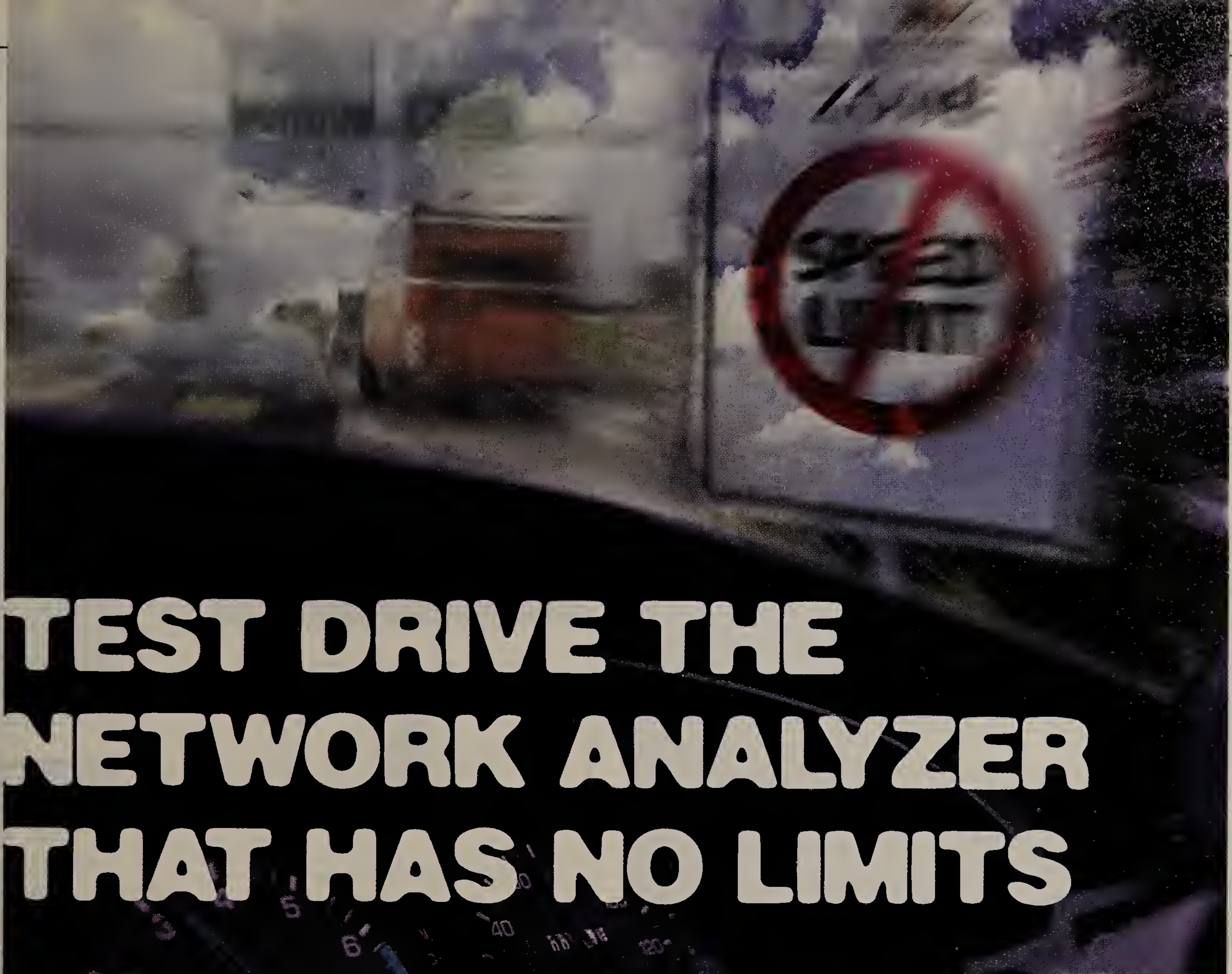

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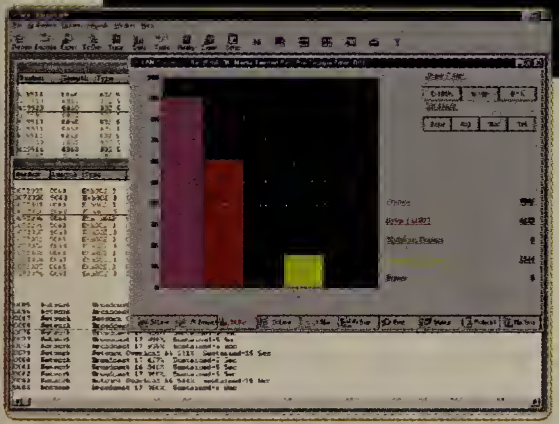

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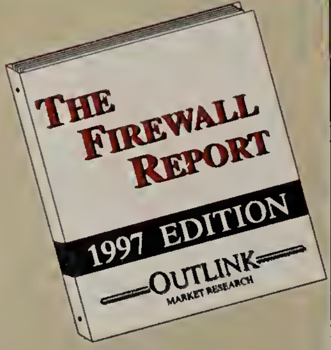

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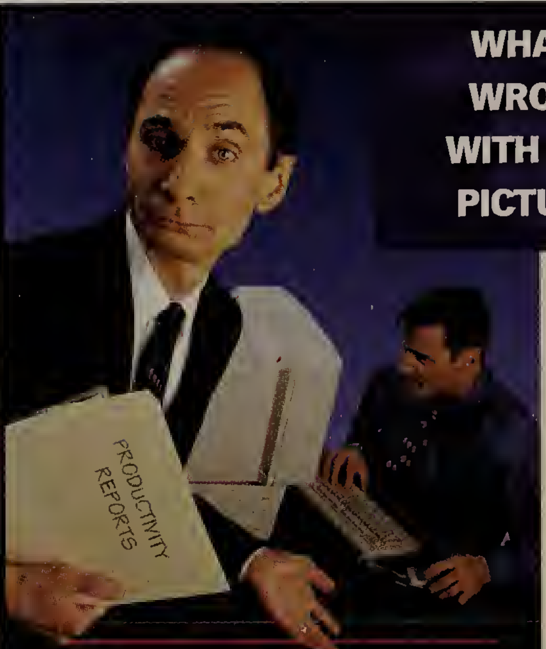

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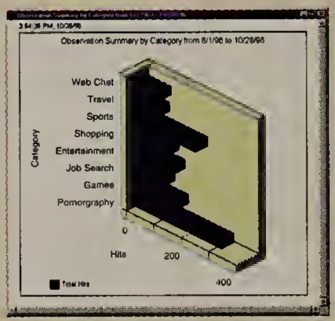

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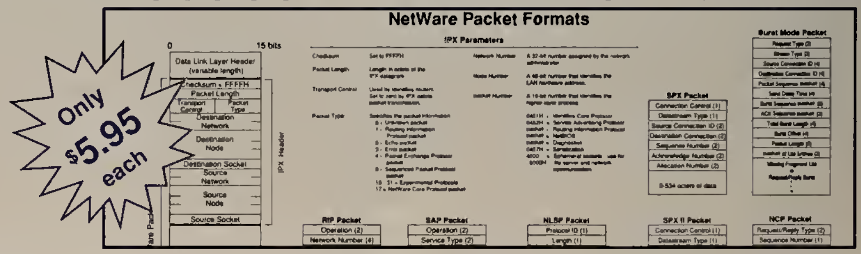

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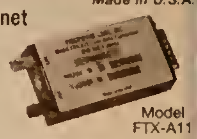

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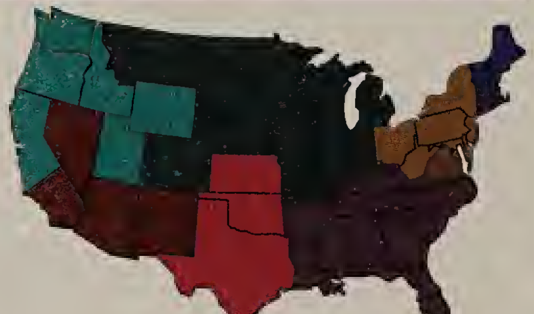

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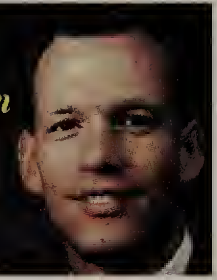
Jefferson

Continued from page 1

Eldon Greenwood, director of product management for the Novell Groupware Division, said Jefferson's poky pace stems in part from the company having to wait on a partner to deliver a critical piece of the product. Novell and Boston-based Inso Corp. announced May 1 that the latter's Outside In HTML Export 1.0 has been licensed to provide back-end HTML conversion technology for Jefferson. Inso already provides document viewing technology in the GroupWise client.

"Now, it's not entirely their fault that we're delayed, but it is partly due to our working with them and our desire to have this automatic HTML conversion in the product," Greenwood said. "If we don't have that, what's the point?"

"Of all of the things we've been talking about over the past six months, Jefferson Project is seeming to resonate most."



Eldon Greenwood, director of product management, Novell Groupware Division

Jefferson's appeal lies in its ability to let any GroupWise user, even a nontechnical one, to dynamically publish documents on the Web, pages that could be accessed by any authorized user from any browser.

Novell has pledged to make itself more of an Internet force since hiring a new CEO, former Sun Microsystems, Inc. executive Eric Schmidt, and establishing an Internet-focused company called Novonyx, Inc. in conjunction with Netscape Communications Corp. While these developments have been generally applauded by Novell customers and partners, they have also created an expectation that big changes may be in the offing.

"There is an issue in general with Novonyx and what it means for GroupWise," Campbell said. "I think users are going to be wondering what's going to come of that from a groupware standpoint."

In another groupware development, Novell confirmed GroupWise 5.2 will be available in a public beta next month.The upgrade will deliver on a number of Internet standards and feature enhancements the company has been promising for some time, such as support for Post Office Protocol 3, Internet Message Access Protocol 4, Lightweight Directory Access Protocol on the client and server, dial-up Simple Mail Transfer Protocol, a Java-enabled client, WebAccess, and imaging and workflow clients.

Greenwood said the release is important because "the perception has been that we have lagged in Internet standards support."

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Borland

Continued from page 1

While the Borland complaint, seeking unspecified damages, points to a recruiting campaign that started in August 1994, the roots of the dispute go back much further.

It all started in late 1992. Microsoft was anxious to crack the PC database market and offered its Access database for an astounding (at least for that time) promotional price of $99. Customers snapped up the product, despite its numerous bugs, with many figuring they could just upgrade to the fixed version later.

Borland, which owned the market with Paradox, was busy fine-tuning its Paradox for Windows, which did not ship until months later. By that time it was too late. A buggy Access had decimated most of the potential market for Paradox.

With Borland on the ropes, its employees became easy prey for Microsoft, which began to target the best and the brightest that Borland — with a reputation for software artistry and meeting deadlines — had to offer.

According to Borland officials and a lawsuit filed last week that reads like a press release — Microsoft never stopped sucking the best brains out of Borland in an attempt to destroy the company.

Dead Borlanders Society

In fact, the influx of Borland employees to Microsoft led to the formation of the informal Dead Borlanders Society, a group that stayed together via E-mail and kept in touch with those still at Borland. But Borland officials claimed the group did more. They said it gave Microsoft information about Borland plans and names of Borland employees to raid. Borland attorneys asked Microsoft sometime ago to disband the informal group, and this reporter was asked discreetly by a member to stop referring to the society in print.

Borland lays most of the blame at the feet of Brad Silverberg, who left Borland to join Microsoft in 1989 and was largely responsible for the launch of Windows 95.

Borland's Yocam *is more than irritated by Microsoft moves.*

The suit contends that Silverberg targeted handpicked Borland employees. To prove Borland's point, the suit contends that Silverberg picked up Paul Gross, the head developer of Borland's tools division, in a limousine and squired him off to an expensive restaurant in an attempt to recruit him.

When that failed, Microsoft offered Gross a million-dollar signing bonus, real estate in Washington, stock options and an immediate three-month sabbatical so he could get married.

The suit alleges that Microsoft's Chairman and CEO Bill Gates himself sweetened the pot. Gross eventually accepted the offer, which included an additional half-million dollar bonus, last September.

A noticeably angry Borland CEO Del Yocam complained about the nerve of Microsoft.

"How flagrant, driving limos up to the front of the company. That is what riles you," Yocam said.

He added his No. 1 goal is to get Microsoft to stop recruiting.

Over the past 30 months, Borland alleges that Microsoft recruited 34 employees in all, placing many in positions nearly identical to those they held at Borland.

"We don't believe their claims have any merit whatsoever. Recruiting is a fact of life in the software industry," said Mark Murray, a Microsoft spokesman.

Murray pointed out that Microsoft has hired 6,793 people in the past three years, and that Borland's head count has declined from 1,900 to 900 over the past three years.

Who's to blame?

Although Microsoft has been an aggressive recruiter, Borland must share the blame.

In 1994 a new management team, headed by turnaround specialist and Chief Financial Officer Keith Maib, laid out a three-year grand plan that developers claimed was thrust upon them without proper consult.

The plan also called for smaller, more monitored development teams, which would crank out products in two-thirds the normal time.

The final straw for some was when managers announced that any employees not onboard with the plan should simply leave. ■

PSINet

Continued from page 1

"Government intervention would be the death knell of the Internet as a viable international communications network," said John Servais, marketing director of Network Access Services, an Internet service provider based in Bellingham, Wash.

"We would then see private ones pop up," he said.

But implementation of the ISOC proposal to add seven new top-level domains and an unlimited number of domain name registrars would invite logistical nightmares, he said.

Ironically, ISOC's desire to quickly bring order to the Internet has instead raised the specter of a balkanized cyberspace. Since the May 1 signing of a proposal to expand the number of top-level domains and domain name registries:

- The White House announced it would not endorse the plan immediately, developed by the ISOC-organized International Ad Hoc Committee (IAHC).
- PSINet, Inc. CEO William Schrader, a prominent and early backer of the IAHC, blasted ISOC for rushing the process without seeking input from the Internet community.

He also said PSINet would not go along with the plan unless it had widespread grassroots support.

"If we don't implement it and a few others don't implement it, then it won't work," said Schrader, who estimated that his ISP controls 15% of the Internet.

- ISOC President Don Heath said a controversial limit of 28 new domain registries — and a corresponding lottery — would be eliminated in the face of criticism, particularly from the European Commission and many would-be registrars.
- Network Solutions, Inc. (NSI), the company the National Science Foundation contracted to register the current top-level domains, threatened to bar the seven new proposed domains from its root servers.

NSI, which would lose its monopoly under the IAHC plan, runs three of the 13 primary root servers around the world, which control ISP access to domain names.

"[That] would be very serious," said IAHC member Dave Crocker. "It could cause a fracture in the Internet Domain Name System."

In urging a delay in the adoption of the IAHC plan, PSINet's Schrader said panel members did not include the Internet community in discussions because they "were motivated by interests of power and timing."

He called for a "global convention to be held in cyberspace, with a high-profile Internet advocate, such as Vice President Al Gore, as moderator."

Heath called PSINet's new stance "very frustrating."

"I don't know what's going on with these guys," he said. "What we're proposing is in the best interests of electronic commerce on the Internet. It is the one centralized plan that's open to the world."

Servais said he prefers that Internet policy be set by a committee of longtime 'Net users, such as the IAHC, rather than governments.

However, he supported Schrader's call for further consideration of the plan to ensure broad acceptance and make sure details are worked out.

"NSI keeps screwing up so much, the idea of having 18 of these outfits . . . How are they going to coordinate that?" Servais said. "The idea of expanding this fast is absolutely crazy."

Len Evenchik, vice president of network services for NetCentric Corp., a software company based in Cambridge, Mass., said commercialization has changed the nature of Internet decision making.

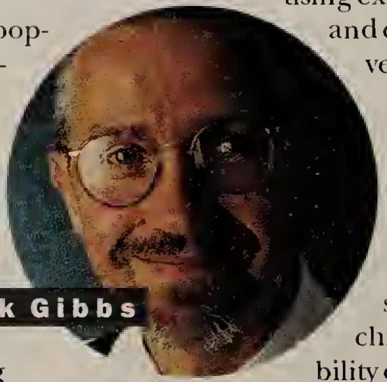
"The Internet was built on what is known as rough consensus," he said. "But it's big business now, so nobody should be surprised by the ferocious discussion going on." ■

Backspin

Online trends, marketing to one and disgusting cigars

"What's all this nonsense about cigars?" chided my esteemed editor. "It's just a fad, and a disgusting one at that."

I, of course, agreed with him wholeheartedly. (Don't irritate your editor, that's my motto. Call me a toad, if you will, but I know who signs the checks, small though they may be).



Actually, the recent rise in popularity of cigar smoking is curious but not unusual. We've seen many trends come and go over the past few decades, and the main driving forces are obvious: TV and radio.

At first blush, one might be tempted to conclude that it's the advertising and marketing components that drive trend-making and trend-breaking in our culture. But the fact is, advertising and marketing aren't alone. It's the combination of those factors, along with opinion makers (consider the impact Larry King has had on suspender sales) and the content of shows (my son is proof of the power of Batman cartoons as merchandising foundation . . . and he's only four!).

As if that combination isn't powerful enough, just wait for what's to come: Ultimately, online marketing will drive most of the trends in our culture.

> *We've seen many trends come and go the past few decades, and the main driving forces are obvious: TV and radio.*

The online services — notably CompuServe and America "OffLine" — were the pioneers of chat rooms — potentially a very powerful marketing vehicle. But when chat rooms evolve into global virtual reality worlds on the Internet and when content is defined by all-singing, all-dancing multimedia, watch out.

Just think of the impact the medium will have on your child when he or she visits virtual Disneyland. Mickey will walk up to your child's avatar and say in his irritatingly squeaky voice, "Hi, want to buy my latest book, Johnny?" Then he'll open it to reveal animated contents that respond specifically to your child.

This will make today's "Daddy, can I have. . ." look trivial compared with the screaming wants created by finely targeted marketing to the audience of one — in this case, your child.

Most importantly, the vendor won't even have to know who any child actually is when they visit the vendor's site. All it needs to know is the behavior of a given ID. Then, using explicit knowledge, heuristics and careful trial-and-error, the vendor can refine its pitch.

For example, ID 40198763 goes (90% of the time) to the latest Batman story rather than the Barbie soap opera or the "Star Wars" episode when they visit BurgerWorld, so we can conclude that the child is probably male (probability of 95%).

Wait, that's a confirmed male, as we just noted his conversation with another visitor (we're obligated to monitor chats for legal reasons).

Further, we can estimate that the child's age is between 3 and 4 years old given the style of the story narrative and the fact that 90% of the time ID 40198763 leaves before the story is complete.

Now we can present Johnny (we just overheard ID 40198763 talking to his pal) with age-, gender- and interest-appropriate content.

This is a whole new style of marketing, and it will be driven by content that is truly sophisticated.

And don't you dare treat these diminutive consumers statistically. If you fail to build a relationship with them very quickly, your competition won't miss the opportunity.

This will be the real drive of interactive media. And it won't be restricted to pitching to children. Oh, no. You'll be a target just as we all will. And I bet we'll like it because it will be personal.

In this environment, trendsetting takes on a new life. And what constitutes fashion will be in your face as soon as its popularity reaches even a minor level of acceptance.

Then, by the use of knowledge, heuristics and trial-and-error, marketers will be able to refine, expand, challenge and destroy trends at an astounding rate.

I bet we could even get my editor to like cigars.

Let me know the latest trend at nwcolumn@-gibbs.com, or keep me clued in at (800) 622-1108, Ext. 504. (Advertising must be trite. It's the law of the jingle.)

'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

NO, REALLY, WE ARE YOUR LEADERS Remember the movie "Stripes"? In the barracks scene, the new Army recruits introduce themselves, and **Bill Murray** begins by noting that "chicks dig me." He then offers his services as "leader" of the platoon, a proposal greeted by fellow soldiers with stony stares and a great rush of unenthusiasm.

In the world of cyberspace, the **Internet Society (ISOC)** is Bill Murray. Worse, it's **Bob Dole,** launching a campaign that gathers the right endorsements but fails to inspire the populace, thus acquiring an aura of inevitable doom.

We figure it's just a matter of time before ISOC President **Don Heath** starts doing Visa commercials.

Heath and others involved in the organization's embattled bid to expand the number of top-level Internet domains and registries say resistance to the proposal has surprised and frustrated them (see story, page 1).

Their frustration is understandable, but they shouldn't be surprised. It was clear last summer when ISOC formed a panel to revamp the **Domain Naming System** that the Internet community was reluctant to march in lockstep behind ISOC or anybody else.

Only when ISOC and its affiliates have genuine grassroots support can they claim a leadership role on the Internet. And who knows, maybe then the "chicks" will even dig them.

NOTES FROM THE SPAM BATTLEFIELD We hear a cry of distress from **Sanford Wallace,** president of bulk E-mail service **Cyber Promotions, Inc.** and candidate for most hated man in cyberspace.

Wallace reports that his Philadelphia-based company was shut down for one day last week thanks to a coordinated attack by "anti-spam" hackers who, he says, planned the assault through newsgroup discussions.

The hackers set up a system that sent millions of "arp" requests to a router, according to Wallace, disabling Cyber Promotion's network and disrupting thousands of businesses that make their money by bombarding us with unwanted commercial solicitations via E-mail.

Oh, the horrors of war.

Wallace calls the attack "analogous to disgruntled recipients of sweepstakes in their postal mailbox storming their local post office and holding all the postal workers hostage until they agree not to deliver more junk mail."

This, of course, is ridiculous. No one in their right mind would storm a post office. It would be like attacking a munitions depot.

Wallace vows to prosecute the hackers. He'd better hope he doesn't get a judge with an E-mail account.

ACQUISITION ACTION **Neural Applications Corp. (NAC)** of Coralville, Iowa, has purchased the San Francisco-based creator of **InvestorsEdge,** a well-known online financial broadcast service.

The purchase of **Ethos Corp.** will allow NAC to combine financial expertise and information with its software, including filter technology, data mining and pattern recognition, according to NAC officials.

InvestorsEdge will retain its online name. Details of the acquisition were not available.

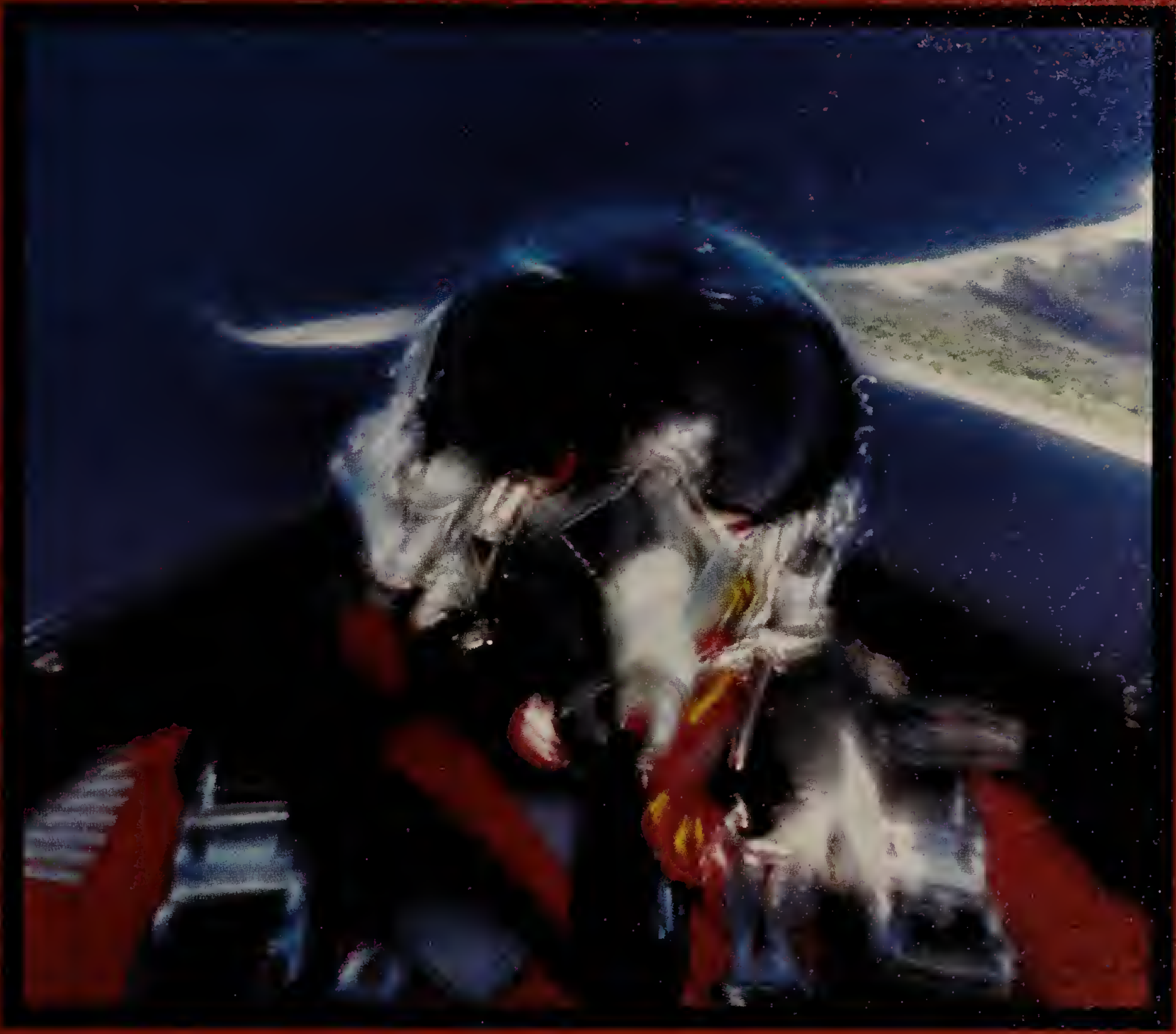
STARTING AT QUARTERBACK FOR USWEB . . . Figuring it's good for business if Internet professionals actually know what they're doing, expanding Web services start-up **USWeb Corp.** this week will announce a certification program for Webmasters, IS folks and programmers.

Officials of the Santa Clara, Calif.-based company say the program is vendor neutral, yet complements and extends existing product training from **Microsoft, Netscape, Novell, Sun** and **IBM/Lotus.**

First, USWeb builds a nationwide network of Web consulting services, and now it offers an educational program. Can a bowl game be far behind?

Give 'Net Buzz your tired, your poor, your huddled Internet and intranet news yearning to be told. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

THE NETWORK IS THE WILD BLUE YONDER. WE'RE THE F-16. YOU'RE THE PILOT. GET ON WITH IT.



We will not waste your time with hyperbole. Paradyne builds digital network access products. CSU/DSUs, including a squadron specially outfitted for frame relay. Unflappable access concentrators. And our new HotWire™ xDSL systems that will send your data screaming across the network at speeds that would melt your oxygen mask. The upshot? Our products do the jobs they are supposed to do. Over and out.

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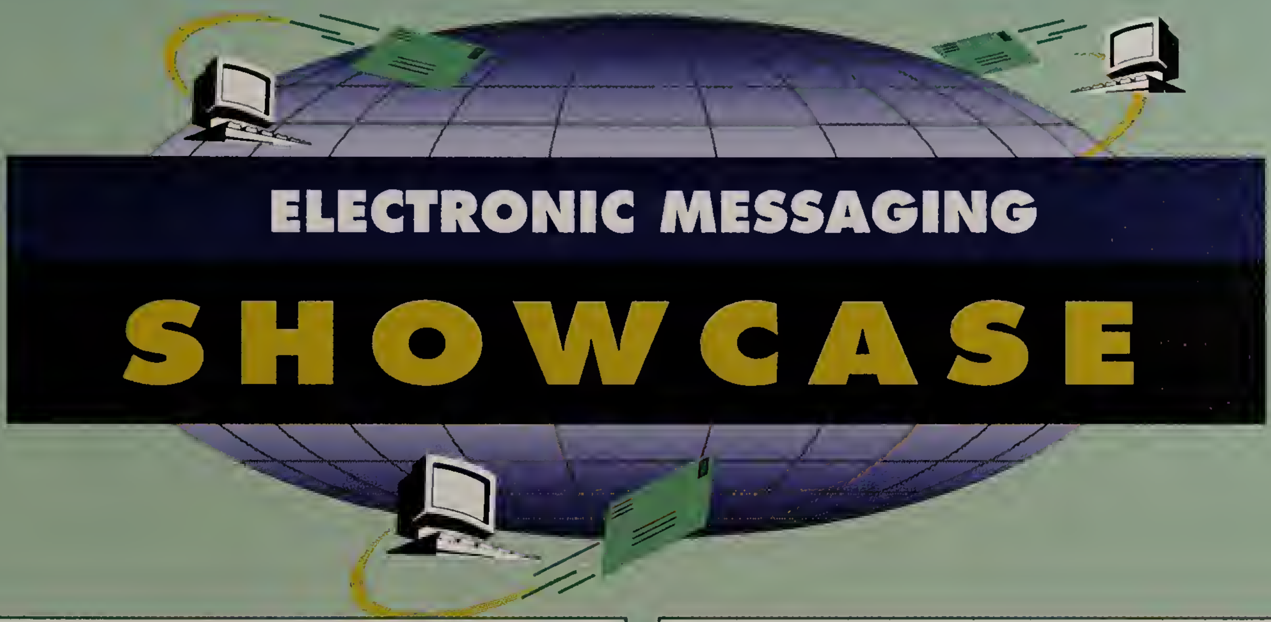

ELECTRONIC MESSAGING SHOWCASE

A global systems integrator, **Control Data Systems, Inc.** helps large companies build enterprise intranets. It is an industry leader in standards-based message switch and directory technology. Control Data applies this expertise to the integration of e-mail, web, and other directory-based applications across client-server networks. Its Rialto line of software products and services integrate the enterprise-wide systems required to create, transmit, access, and control electronic information.

CONTROL DATA
The Integration Company

http://www.cdc.com

DIGEX specializes in maximum-speed Internet access and mission-critical Web site management for those businesses that are serious about harnessing the power of the Internet. We have the fastest Internet access available and the largest dedicated server facility in the world. DIGEX provides world-class Internet services and support to the growing number of companies that consider the Internet a critical part of their business strategy.

DIGEX
BUSINESS INTERNET

http://www.digex.net

With Microsoft Exchange™ joint wins approaching one million seats in less than one year, **DIGITAL** puts its Windows NT™ solutions experience to work to address customer requirements for mail integration and migration. DIGITAL's Alpha™ and Intel® hardware, added-value software and services enhance customers' multi-vendor enterprise mail environments, spanning Windows NT, OpenVMS, and UNIX systems.

digital™

http://www.digital.com/info/alphaserver/solutions/mail/mail.html

ISOCOR is a leading international provider of backbone server software and directory-based software solutions for electronic information exchange utilizing Internet technologies and international standards. ISOCOR solutions are designed to enable customers to implement full service Intranets, link dissimilar mail systems and business applications communicating via a wide variety of protocols, including SMTP/MIME and X.400. The company's products are supported by ISOCOR worldwide through more than 120 resellers and systems integrators in more than 50 countries. ISOCOR's corporate headquarters are located in Santa Monica, California.

ISOCOR®

http://www.isocor.com

Lotus Development combines the industry-leading advanced messaging capabilities of Lotus Domino and Notes with full support for the latest Internet mail standards. Messaging solutions from Lotus offer integrated, cross-platform services, which mean unbeatable performance and reliability, while reducing cost of ownership and simplifying administration. Domino and Notes technology provide a solid foundation to support a family of standards-based clients that range from lightweight Java for network computers to rich intranet and messaging integrated clients, as well as robust scalable servers. By embracing open messaging standards such as POP3, SMTP/MIME, IMAP4, LDAP/X.500, and ICAP, Lotus lays the groundwork for your mission critical messaging needs.

Lotus

http://www.lotus.com/messaging

Novell GroupWise keeps you in control by expanding E-mail with powerful communication tools. It integrates E-mail with calendaring/scheduling, document management, remote access, voice mail, faxing, Internet/Intranet messaging, across Windows (3.1, 95, NT), UNIX, and Macintosh. "GroupWise is an easy way to improve communication. It's more widely used because it is so easy to learn . . . everyone uses it." Sharon Pryor, The Toro Company. You can access GroupWise from a laptop, telephone, or even a WWW browser.

Novell®

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Pretty Good Privacy, Inc. addresses the two most pressing issues that must be resolved for the Internet to become a serious business tool: security and navigation. Millions of people worldwide trust Pretty Good Privacy for private communications and secure data storage. With the acquisition of Zoomit Corporation and its Meta-Directory technology, Pretty Good Privacy joins together the disparate network and database directories within a company. Now, information is protected at its source and available universally.

PRETTY GOOD PRIVACY

http://www.pgp.com

Software.com is the leading developer of Intranet and Internet-based messaging server software. The company focuses on open, highly-scalable, commercial-grade messaging and directory software that enables corporate end-users and service providers to quickly, reliably, and seamlessly exchange multimedia information over the Internet. Software.com has two flagship products: Post.Office™ and Intermail® both of which are scalable, secure, and simple to manage. The products run on a number of Unix and Windows NT platforms.

Software.com™
The Internet Infrastructure Company

http://www.software.com

Soft-Switch, a division of Lotus Development Corporation, a wholly-owned subsidiary of IBM, is the global business unit focused on the message integration market. Soft-Switch delivers products and services which meet the connectivity, directory, and management requirements of enterprises with multiple messaging systems. As the most experienced and successful integrators in the enterprise messaging marketplace, Soft-Switch clearly understands the pressing challenges global organizations face as they migrate to client/server architectures, consolidate dissimilar systems, deploy mission-critical, mail enabled-applications, deal with exploding levels of message traffic and move to exploit the Internet.

Soft-Switch

http://www.ssw.com

TOPCALL Enterprise Fax and Messaging Solutions: The Single-Source Messaging Solution. Worldwide leader in high-volume enterprise Fax/messaging solutions, provides stable, turnkey Fax and other external messaging facilities for Lotus Notes, cc:Mail, Microsoft Exchange, MS Mail, HP OpenMail, GroupWise, plus general business applications including SAP's R/3 and R/2. TOPCALL integrates these applications with Internet mail, Telex, and x.400 (using familiar client interfaces for both sending and receiving). TOPCALL has 20 years of experience as a global market leader and nearly 3000 installations at mainly Fortune 1000- and Global 2000-sized companies. U.S. Headquarters: 610/688-2600 or 1/888/4/TOPCALL.

TOPCALL
Enterprise Fax & Messaging Solutions

http://www.topcallusa.com

WILTEK, Inc. provides messaging integration, directory services, and consulting to Fortune 1000 companies. These outsourced services are targeted at companies with proprietary, disparate e-mail systems, looking to incorporate Internet messaging technology to form corporate Intranets, Extranets, and Virtual Private Networks. WILTEK's 24x7 systems and operations centers in the U.S. and U.K. house the hardware and software platforms and the staffing to support these services. Our customers preserve existing technology infrastructure investment while blending newer messaging technology, without the associated costs of in-house hardware/software and staffing. WILTEK also provides customized Worldwide Fax delivery services, and is a Microsoft Solution Provider Partner specializing in MS Backoffice consulting.

WILTEK
We Get Your Message Across

http://www.wiltek.com

Worldtalk Corporation is a leading provider of directory-based software solutions that support organizations in transforming intranets into secure, robust, and cost-effective platforms for business-critical applications and electronic commerce. Worldtalk's solutions are designed to enable these organizations to build, evolve, and expand full-service intranets, while leveraging their existing infrastructure. The company focuses on e-mail, groupware, directory, and security applications.

Worldtalk®

http://www.worldtalk.com

the best tools
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